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Public Sewerage Needs in States

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NATIONAL INVENTORY OF NEEDS FOR SANITATION FACILITIES

III. SEWERAGE AND WATER POLLUTION ABATEMENT [1]

GENERAL ASPECTS

Under the more primitive conditions of life, such as existed in the United States during the early days of the Republic, the disposal of household and other wastes was a comparatively simple problem, involving few if any intercommunity implications. In the rural sections of the country, substantially the same conditions are found today, except that the time-honored "privy" has been greatly improved in its functional design for good sanitation and the installation of running water supplies in many farm homes has made possible water-carriage systems of sewage disposal, utilizing individual cesspools, septic tanks, and subsurface tile grids for the final disposition of effluents.

With the development of urban communities, the disposal of wastes became a serious problem of public sanitation, which was not adequately solved until public water supplies were established and the construction of water-carriage sewer systems thus made possible. In modern cities, these sewer systems, constituting vast networks of interconnected underground conduits, are among the engineering marvels of the present age. Their phenomenal development within the past century has marked a new era in community sanitation, both in the United States and in other countries. The resulting improvement which they have wrought in the healthfulness and convenience of urban life has been reflected by the marked reduction in the prevalence of water-borne and fly-borne diseases which has been experienced in all communities served by public sewerage.

The widespread solution of this problem from the standpoint of local sanitation has resulted, however, in the creation of another problem of more far-reaching significance, namely, the increased pollution of the natural waterway systems of the country, in consequence of the concentration of large volumes of sewage and industrial wastes in streams, lakes, and coastal waters, which ordinarily

[1] Prepared by the Sanitary Engineering Division, United States Public Health Service.

afford the only means available for the ultimate disposal of these wastes. According to an estimate by the National Resources Committee (*1*), the total volume of sewage, both treated and untreated, which was being discharged through public sewer systems in 1938 amounted to some 5¾ billions of gallons daily. Approximately three-fifths of this total volume of sewage is treated to some degree, the remaining two-fifths being discharged without any treatment. The resulting increase in waterways pollution, in many cases far beyond the capacity of these watercourses for natural purification, has created a situation quite aptly termed by the National Resources Committee as one of "national concern."

In considering the needs which now or hereafter may exist for the further extension of public sewerage systems in the United States, it is imperative that full account be taken of the closely related needs, greater in the aggregate at present, for the abatement of water pollution, both resulting from the construction of sewer systems up to this time and also from that which may be expected to be added by any sewer extensions planned for the future. This need has been an important element in that part of the total needs for sanitation facilities with which the present paper deals.

Before considering in detail the results of this section of the inventory, it will be desirable to sketch very briefly the historical background of the particular needs with which it is concerned. In this connection, the three principal topics to be discussed are: (1) the development and present status of public sewerage systems in the United States, (2) the progress thus far made in the development of sewage and industrial wastes treatment, and (3) the history and present trend of water pollution and its abatement.

DEVELOPMENT OF PUBLIC SEWERAGE SYSTEMS IN THE UNITED STATES

The development of public sewerage systems in the United States dates from the year 1855, when the first comprehensive system in this country was designed for the city of Chicago. In 1860, according to Hyde (*2*), about 1,000,000 people of a total urban population of 6,000,000 were provided with some kind of sewerage, representing 17 percent of that total In 1900 this number had increased to about 25,000,000, or roughly 35 percent of the total urban population. At the end of 1942, according to recent surveys of sewerage facilities in the United States conducted by the Public Health Service (*3*), with the cooperation of the State departments of health, the total population of some 8,434 communities, both incorporated and unincorporated, with 100 or more persons, had reached approximately 81,000,000, of which 70,900,000, or 87 percent, were estimated as being connected to sewers. Referring only to incorporated communities of more

than 200 population, a total of 7,484 such communities, having a combined population of 78,906,000, is now provided with sewerage facilities, either wholly or in part.

These figures indicate broadly that during the past 4 decades the total population connected to sewer systems has increased more than 3 times and its percentage of the total urban population by about 2.5 times. This situation is somewhat better than noted in 1926 by Fuller and McClintock (*4*) who remarked that over 4 times as much polluting matter was reaching American waterways then as 30 years previously.

SEWAGE TREATMENT

The general problem of sewage disposal is one of providing adequate and proper treatment facilities where necessary in order to supplement natural dilution. The development of sewage treatment in the United States has taken place largely within the past 50 years. In the year 1900, according to Hyde (*2*), roughly 60 municipal sewage treatment plants were serving a total population of about 1,000,000, or 4 percent of the population living in sewered communities. In 1935, there were approximately 3,700 municipal treatment plants serving a total population of 28,500,000, or 41 percent of the population resident in sewered communities. During the next 5 years, 1935-40, under the stimulus of Federal-aid projects, the number of treatment plants and population served increased phenomenally.

In 1942, according to the Public Health Service surveys, some 5,126 incorporated and unincorporated communities having 100 or more persons connected to sewers were wholly or partially served by 5,600 treatment plants. The estimated population connected to treatment plants was about 42,200,000, or 60 percent of the population connected to sewers. As the latter was about 70,900,000, the total population discharging untreated sewage through public sewer systems thus approximated 28,700,000 in that year. During the past 3 years community sewerage construction has been progressively curtailed except for construction in military and war industrial areas, resulting in a sizable backlog of deferred projects and suspended construction. Brief statistics on facilities under construction, or on which construction has been suspended, are given in a later paragraph.

Since the early years of sewage treatment, methods and processes have undergone a considerable degree of variation and elaboration, though some of the older processes, modified to some extent, have remained basically unaltered. In general, sewage treatment processes now are broadly classified as "primary" and "secondary," according to their degree of elaboration and purification effected. Primary treatment ordinarily includes screening and various methods of sedimentation.

Secondary treatment embraces the various additional processes, such as chemical treatment, activated sludge treatment, and the use of trickling or intermittent sand filters, which are designed to secure a higher degree of purification. Chlorination may be an adjunctive feature of either primary or secondary treatment, designed to reduce the content of sewage bacteria in watercourses receiving treated effluents. In general, it may be assumed that as an average, primary treatment effects about 35 percent of purification, and secondary treatment about 85 percent. These figures are approximate and subject to considerable variation in individual cases, according to local conditions and methods of treatment.

According to sewerage census data assembled up to the end of 1942 (*3*), treatment facilities serving the 5,100 communities previously mentioned were distributed as follows:

Treatment	Number of plants	Percent of total plants	Estimated population served	Percent of total population
Minor	50	0 9	3,300,000	7.8
Primary	2,848	50 8	15,900,000	37.7
Intermediate and secondary	2,712	48 3	23,000,000	54 5
Total	5,610	100 0	42,200,000	100.0
Plants with chlorination	1,168	20 8	14,980,000	35.5

In addition to the facilities in service reported above, community sewerage projects under construction, including those on which construction was suspended, based on data available for projects being constructed prior to 1943, included initial sewer systems and treatment plants for some 95 communities with 120,000 total population, initial sewer systems for 8 communities totaling about 12,000 population, initial treatment plants for 28 communities having existing sewer systems discharging sewage raw and serving connecting populations aggregating 470,000, and raising in 18 communities the existing degree of treatment variously from one to another of the general classifications indicated in the above table and involving some 1,200,000 connected population. In similar construction status prior to 1943 were treatment plant improvements and replacements which might be roughly classed as being within one or another of the general distribution groupings listed above. Later reports may reveal a number of new projects and improvements above-mentioned to have gone into operation during 1943, or some prior to that year.

WATER POLLUTION

According to the figures previously cited, about 29,000,000 people in 1942 were discharging raw sewage, and roughly 42,000,000, sewage treated to some degree, into the natural waterways of the United

States. Of the latter group, it has been noted that 3,300,000 were served by minor treatment, 15,900,000 by primary treatment, and 23,000,000 by intermediate and secondary treatment. Of this latter group, about 3,500,000 were served by intermediate treatment and 19,500,000 by secondary treatment. If it be assumed that minor treatment effects no purification, primary treatment 35 percent, intermediate treatment 50 percent, and secondary treatment 85 percent, it may be estimated roughly that the total residual polluting effect of this combined population would be equivalent to the raw sewage from approximately 18,400,000 population. When added to the 28,700,000 discharging raw sewage, this would make a total of about 47,000,000 whose raw sewage contribution would be approximately equivalent, in polluting effect, to that of the 71,000,000 discharging raw and treated sewage combined.

In addition to domestic sewage, large volumes of liquid wastes from industrial processes are discharged into natural watercourses, either directly or through sewer systems. Various estimates have been made as to the total pollution effect of these wastes in terms of equivalent populations contributing raw sewage. In the Ohio River Basin, the total industrial wastes pollution has been estimated as being equivalent to the raw sewage contributed by about 10,000,000 people. This is 116 percent of the actual sewered population, which approximates 8,620,000.

For the entire country, it may be estimated roughly that the total industrial wastes pollution is equivalent to the raw sewage discharged by a population of about 55,000,000 or 60,000,000. This estimate has been made by assuming that the total industrial wastes pollution in the 48 States would bear the same ratio to the corresponding total for the Ohio River Basin, both expressed in terms of sewage-contributing population, as is borne by the estimated financial values of products manufactured by the waste-producing industries in these two respective areas, as given by the National Resources Committee (*1*). This assumption is not valid for individual industries, but may be roughly correct for the various industries making up the group considered. On this basis, it may be estimated that the combined sewage and industrial wastes pollution for the country as a whole approximates the raw sewage contribution of not less than 100,000,000 people, including the 47,000,000 of equivalent sewage-contributing population.

These figures afford a very rough index of the present extent of water pollution in the United States and the magnitude of the problem of pollution abatement which is thus presented. This problem is a many-sided one, with widely divergent aspects, according to the various needs of industry, agriculture, commerce, and urban development affecting water use and waterways utilization in different parts

of the country. The problem also involves to a considerable extent certain broader interests of the entire population, such as the recreational use of natural watercourses and the propagation of fish life as an important element in the Nation's food supply.

In the report previously noted (*1*), the National Resources Committee has summarized its findings and recommendations with respect to the status of water pollution in the United States in 1939. In this connection, it was pointed out: (1) that water pollution is a problem of national concern, though most serious in the more populous and highly industrialized northeastern section of the country, (2) that it is inimical to the public interest in a variety of ways, and (3) that a reasonable program of pollution abatement would cost about $2,000,000,000 and require 10 to 20 years for its completion.

Nearly 25 years ago, F. H. Newell, former director of the United States Reclamation Service, described the various uses of water, listing them in decending order of importance as follows (*5*):

1. Human consumption (drinking).
2. Production of food (watering stock, irrigation, and fish propagation).
3. Disposal of wastes.
4. Industry (water power, steam power, and industrial processes).
5. Transportation (navigation).

To this list may be added:

6. Recreation (boating, bathing, camping, and sport fishing).

Under various local conditions affecting individual watercourses or geographical areas, the relative order of importance of these uses has been found by experience to be subject to some variation, though in general it probably remains today substantially as given by Newell. In Wisconsin and Minnesota, for example, as well as other vacation areas, recreational use of waters would stand very high in relative order of importance. In some industrial areas the use of water for industrial purposes would have a priority. It is to be noted that Newell was one of the early proponents of using waterways for the disposal of wastes, which has become generally recognized as a legitimate use, when not abused so as to interfere with other essential or desirable uses.

Damages resulting from water pollution may be classified as follows, roughly in the order of their relative importance, but subject to alteration in this respect in different areas and under various circumstances affecting water uses:

1. Damage to public water supplies used for domestic purposes (drinking and culinary use).
2. Damage to agriculture and food fish propagation (food production).
3. Damage to industrial uses of water.
4. Interference with navigation.
5. Damage to recreational uses.
6. Damage to land and property values not above included (resulting mostly from "nuisance" conditions).

In the Ohio River Basin, which presents both a large and typical industrial area in its northern section and an extensive rural area in its southern portion, the effects of pollution are fairly representative of those which have been experienced in other industrial areas throughout the country. Many water supplies, domestic and industrial, have suffered from the effects of sewage and industrial wastes, both from the standpoint of palatability and other physical and chemical qualities and from that of the public health. Although typhoid fever prevalence has been greatly reduced by effective municipal water purification, outbreaks of other intestinal diseases, apparently water-borne, have occurred from time to time, especially during or following periods of low stream flow. Recreational facilities have been materially damaged. Food fish and other aquatic life have been destroyed, or detrimentally affected. Property values along some streams have been reduced because of "nuisance" conditions caused by excessive pollution. Navigation has been seriously affected by corrosion of metal parts of river craft, and dams by acid waters. Agriculture has suffered from the deterioration in the quality of stream waters used for stock watering and irrigation.

ECONOMIC LOSSES FROM WATER POLLUTION

The economic losses resulting from water pollution over the entire country cannot be estimated with any degree of completeness or accuracy, because of the manifold types of damage resulting from pollution and the wide variety of local conditions which are concerned in such damage. Moreover, factual data bearing on the actual costs of pollution in terms of total damage to waterways, which not only are used for certain purposes but could be used for additional purposes if relatively unpolluted, are at best incomplete and in some instances almost wholly lacking. The element of intangible losses resulting from excessive water pollution and, conversely, of intangible benefits following its correction, is a very large one in many situations, particularly in those involving recreational uses of waterways and the various types of urban development which are affected by pollution in its different aspects. These intangible losses and benefits are difficult to evaluate in financial terms, which cannot, in fact, include all of the real liabilities and assets thereby involved.

Bearing on this phase of the subject, the experience of Wisconsin and Minnesota has been of particular interest, because these two States are well-known vacation areas in which the value of good streams and lakes is recognized as a definite public asset. In a special report on stream pollution in Wisconsin (*6*), issued in 1927, it was estimated, on the basis of a State-wide questionnaire to vacationists, that the income value of natural bodies of water in that

State for pleasure fishing alone approximated $10,000,000 annually, the total vacational expenditure being about $100,000,000 per year. Commercial fishing was valued at $750,000 annually. Substantially the same figures for Minnesota were derived from a similar estimate described in a report by the Metropolitan Drainage Commission of Minneapolis–St.Paul in 1928 (*7*). In this report it also was estimated that correction of pollution in the upper Mississippi River in the Twin Cities district would add a total of $1,500,000 to $2,500,000 to land values in that district alone, together with a river frontage value increase of $1,500,000. Commercial and sports fishing in the same district were valued at $110,000 annually. These combined benefits, both for Minnesota and Wisconsin and for the Twin Cities, would amount to somewhere between $4 and $5 per capita, on the basis of the respective populations of these areas.

The economic losses resulting from certain types of damage to water supplies, some of them due to pollution of their sources, have been discussed in the first paper of this series (*8*). In a note prepared for the National Resources Committee,[3] Jordan has estimated that a variation from low to high pollution load on water treatment plants would entail an increase in the cost of operation from $7.90 to $16 per million gallons. From statistics of construction and operating costs for 10 Ohio River water filtration plants handling raw waters of various average degrees of pollution, it has been shown by Streeter (*9*) that an increase in the yearly average raw water pollution load, expressed in terms of the coliform bacteria index, from 5,000 to 20,000 per 100 milliliter has added about $1 per capita annually to the total cost of water purification. Although this represents a definite tax on water consumers, due to pollution, it does not tell the whole story, as it fails to take account of the general depreciation in the palatability and other qualities of water supplies which has been experienced from excessive water pollution by sewage and industrial wastes. Although water-borne typhoid fever prevalence has been greatly reduced as the result of advances made in the technology of water purification, this disease still imposes a considerable annual economic loss on the country, and other water-borne diseases, mostly nonfatal, have continued to cause financial burdens such as those discussed in the first paper of this series (*8*).

The economic losses resulting from industrial wastes pollution are so variable according to the types and volumes of wastes involved that no reasonably complete evaluation of them is possible at the present time. In the Ohio River Basin, it has been estimated (*10*) that the total damage to streams caused by acid mine drainage water amounted to roughly $2,000,000 annually in 1940. At this time, sealing of mine openings had reduced the original mine-acid load by

[3] Appendix to reference 1.

about 25 percent. Certain industrial wastes, such as those from coke byproducts, producer gas, carbide, and oil refinery plants, have caused such objectionable tastes and odors in affected water supplies that many private bottled-water companies have done a thriving business among those able to afford such a luxury. In the first paper of this series, figures have been cited bearing on estimates of the per capita cost of bottled water in one typical case of this kind. Pollution of streams by sewage and industrial wastes rendering them unfit for stock watering and other agricultural uses has imposed heavy damage claims, upheld by the courts, on polluters in numerous instances.

These are but a few examples of the economic burden imposed on riparian dwellers and communities by water pollution in its various aspects. Although it would be extremely hazardous to estimate from the available data what the total burden may be in this respect, it is safe to say that it probably amounts to at least $1 per capita annually for 75 percent of the entire population of the United States, or roughly $100,000,000 annually for the entire country. Making due allowance for the intangible elements involved in such an estimate, such as general depreciation of land values, deterioration of water supplies, and damage to existing and potential recreational areas near centers of population, all of which are affected by pollution in ways which cannot be evaluated fully in financial terms, it seems likely that this estimate, admittedly a very rough approximation, probably errs materially on the side of conservatism.

THE PRESENT INVENTORY

The present inventory was undertaken in March 1943, in connection with a general survey of sanitation needs instituted by the States Relations Division of the Public Health Service through the Sanitation Section.

Basic data for the inventory have been obtained from 10 main sources as follows:

1. United States census data for 1940, listing incorporated communities and their populations.

2. A national census of sewerage systems and sewage treatment plants in the United States up to the end of the year 1940, as compiled by the United States Public Health Service, with cooperation by the State departments of health, together with unpublished supplements for 1941 and 1942.

3. Ohio River Pollution Survey, Final Report to the Ohio River Committee, United States Public Health Service and United States Corps of Engineers.

4. Reports of the National Resources Planning Board, dealing with sewage disposal and stream pollution abatement projects.

5. War Emergency Survey Reports, United States Public Health Service.
6. Reports of reconnaissance surveys by the Public Health Service.
7. Public Works Administration non-Federal projects. Publication No. 104, Public Works Administration (1940).
8. Engineering estimates for post-war construction from State and local agencies.
9. State health department reports and data.
10. Data from engineering publications.

POPULATIONS AFFECTED BY PRESENT NEEDS FOR SEWERAGE AND SEWAGE TREATMENT

In compiling the inventory it has been aimed to show the populations of all incorporated communities of more than 200 inhabitants in each State needing additional sewerage and sewage treatment facilities of various types, together with the estimated costs of such facilities, brought to the 1942 price level.[3] The provision of such facilities would provide every incorporated community of more than 200 population with a complete sewer system and adequat sewage treatment, to which all of the inhabitants of each community would be connected, except those who could not be served with reasonable economy.

In estimating the needs for new sewer systems, or for extension of present systems, the additional populations to be served by these improvements have been based, in each case, on the difference between the total population of a community, as shown by the United States Census of 1940, and the number of people in that community who are now connected to the sewer system, according to the latest information available from the Public Health Service census of sewerage facilities (substantially up to the end of 1942). In estimating the populations needing intercepting sewers, it has been assumed that every incorporated community now sewered, but not provided with sewage treatment, will require this facility as an essential step toward the construction of a treatment plant.

With reference to sewage treatment, existing needs have been based on meeting requirements of three general categories, namely, (1) new sewage treatment plants for sewered communities now discharging raw sewage, (2) new treatment plants for communities not at present sewered, but needing such facilities, and (3) improvements and extensions to existing treatment plants. In estimating the populations needing new sewage treatment plants, as under categories 1 and 2, provision has been made for each incorporated community of more than 200 inhabitants falling under either one of these two categories. In this connection, the designed population to be served by each plant

[3] Some 1,550 small communities of less than 200 inhabitants were omitted from this inventory as presenting a special problem.

has been increased over that which is shown by the 1940 census by 10 percent for communities of less than 10,000 inhabitants and by 20 percent for all larger communities.

In some instances, where the self-purification capacities of natural watercourses are adequate to take care of the untreated wastes of particular communities without endangering the normal use of such watercourse for other essential or desirable purposes, the provision of sewage treatment facilities may be unnecessary, or at least deferable for an indefinite period of time. To this extent, the inclusion of every community in the three categories of needs above described doubtless would represent a certain degree of overstatement of such needs, insofar as the immediate future is concerned. On the other hand, the provision of at least primary treatment facilities for all sewered communities, regardless of their position in relation to natural watercourses, has been contemplated as an ultimate goal in the more recent trend of thought concerning these matters. Although this general policy may be unjustified in some cases, it provides for maximum needs in any event and, in the absence of detailed information as to local situations, probably is the most rational basis for preliminary estimates such as are involved in the present inventory.

Estimates of populations affected by improvements and extensions of existing sewage treatment plants have been obtained by taking the difference between the 1940 census population, increased by 10 or 20 percent if less or greater than 10,000, respectively, and the population for which the existing plant has been designed, based on its present capacity. This difference has been considered as representing the additional population of the community for which extensions of present treatment facilities will be needed.

Although these several estimates have been made for every community individually, it obviously would be impracticable to present within the compass of this paper such detailed information as thereby would be involved. For practical purposes, therefore, it will be sufficient to show here the total populations affected by needs of various types in each State and in the District of Columbia.

In table 1, for general reference, is given a summary of the number of incorporated communities in the United States classified according to population, together with the total populations of these incorporated places, grouped according to a somewhat broader classification. Reference to this table shows that a total number of 16,752 incorporated communities, with a combined population of 83,766,379, was listed in the 1940 United States Census and that 10,083 of these communities, with a combined population of 4,315,843, had less than 1,000 inhabitants individually. The bulk of the urban population, amounting to 74,423,702, was found in communities of over 2,500 population.

In order to show the present status in the provision of public

sewerage facilities table 2 has been compiled, giving for each State the number and total population of incorporated communities now provided with sewer systems. In this table the communities have been classified according to their individual populations, the lowest range being 1,000 and under and the highest 50,000 and over. In columns 9 and 10 the combined figures are given for all sewered communities in each State. These combined figures show a grand total of 7,484 incorporated communities, having a total population of 78,905,826, now provided with sewer systems.

TABLE 1.—*Number and population of incorporated communities in the continental United States, as given by the 1940 Census, classified according to population*

[Incorporated places]

Population range	Number of communities	Population
Total	16 752	
Under 1,000	10,083	
1,000 to 4 999	4,627	
5,000 to 24,999	1 630	
25,000 to 49,999	213	
50,000 to 99,999	107	
100,000 and over	92	
Under 1,000	10 083	4,315,843
1,000 to 2 500	3,205	5 026 834
Over 2,500	3 464	74,423 702
Total	16 752	83,766,379

A comprehensive estimate of these needs is shown, however, in table 3, which has been compiled from a detailed study of the requirements for each individual community of more than 200 population. In this table it is indicated that new sewer systems are needed for a total of 7,718 communities with a combined population of 4,835,847. It is of some interest to note that about 60 percent of the communities needing new sewer systems have less than 500 inhabitants and 87 percent less than 1,000, thus indicating that most of the existing needs in this respect are to be found in the very small communities.

The needs for extension of existing sewer systems are measurably greater than for the construction of new systems, as is revealed by the figures in table 4, which show a total additional population of 10,297,300 in communities now sewered for which sewer extensions are needed. The distribution of this population among the 48 States is roughly in accordance with the distribution of urban population, as is likewise true of the sewered population figures in table 2, though exceptions are to be noted in certain States which have undergone a rapid increase in urban population recently. An example is found in California, in which the largest unconnected population of sewered communities is noted. The total unsewered population in sewered

communities throughout the entire country is shown by comparison with the total population of these communities (table 2) to amount to 13 percent of the latter. Thus it may be said that approximately

TABLE 2.—*Number and population of incorporated communities provided with existing sewer systems*

[Classified according to population]

State	Population range								Combined total	
	1,000 and under		1,000–4,999		5,000–49,999		50,000 and over			
	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)
Alabama	26	19,848	73	176,481	23	275,973	4	451,880	126	924,182
Arizona	2	1,879	13	33,509	9	86,217	1	65,414	25	187,019
Arkansas	16	10,912	67	165,439	21	234,821	1	88,039	105	499,211
California	25	16,367	120	328,441	96	1,239,469	13	3,401,895	263	4,986,172
Colorado	29	23,983	47	106,537	15	165,422	2	374,574	103	670,466
Connecticut	----	-----	2	6,042	20	472,514	5	641,992	27	1,120,548
Delaware	3	2,758	13	33,158	1	5,517	1	112,504	18	153,937
District of Columbia	---	-			-		1	663,091	1	663,091
Florida	14	9,771	62	153,905	28	386,061	4	514,440	108	1,064,177
Georgia	21	14,182	108	261,791	30	316,284	5	575,348	164	1,167,605
Idaho	0	0	5	16,291	10	122,499	0	------	15	138,790
Illinois	63	43,063	218	519,182	106	1,449,220	9	3,993,065	396	6,004,530
Indiana	79	55,401	116	250,644	59	689,154	8	1,003,062	262	1,998,261
Iowa	141	93,252	164	335,438	39	492,175	5	422,085	349	1,342,951
Kansas	74	48,227	104	226,996	29	336,128	3	304,257	210	915,608
Kentucky	23	17,075	86	195,780	28	370,517	2	381,095	139	964,467
Louisiana	2	1,474	38	108,365	25	396,100	2	592,704	67	1,098,643
Maine	--	-	6	18,857	19	253,040	1	73,643	26	345,540
Maryland	29	16,293	29	66,840	8	131,630	1	859,100	67	1,073,863
Massachusetts	---	---	9	34,920	96	1,574,501	16	2,219,593	121	3,829,014
Michigan	69	44,903	146	323,578	67	927,567	9	2,337,431	291	3,632,179
Minnesota	128	81,005	143	282,055	40	388,057	3	881,171	314	1,632,288
Mississippi	33	21,403	55	127,890	21	279,854	1	62,107	110	491,259
Missouri	32	21,241	118	258,564	43	474,752	4	1,352,175	197	2,106,732
Montana	23	14,539	32	66,286	12	177,945	0	0	67	258,770
Nebraska	91	61,700	88	167,409	15	146,908	2	305,828	196	681,845
Nevada	3	2,626	6	16,402	3	35,057	0	0	12	54,085
New Hampshire			2	8,498	15	197,042	1	77,685	18	283,225
New Jersey	27	14,802	63	185,876	106	1,521,825	13	1,657,981	209	3,380,487
New Mexico	12	8,812	17	42,550	13	142,372	0	0	42	193,752
New York	38	27,424	147	380,411	100	1,429,786	13	9,375,492	298	11,213,113
North Carolina	90	56,503	110	231,476	40	511,669	5	351,538	245	1,151,186
North Dakota	38	26,418	35	53,006	9	118,247	0	0	82	197,671
Ohio	146	89,868	218	479,469	102	1,858,127	12	2,899,418	478	5,326,882
Oklahoma	55	35,809	111	232,998	40	427,110	2	346,581	208	1,042,498
Oregon	34	18,971	41	102,002	15	162,593	1	305,394	91	589,960
Pennsylvania	64	46,485	242	611,565	172	2,008,110	16	3,720,377	494	6,386,537
Rhode Island	-----	-----	1	3,842	10	245,193	2	329,301	13	578,336
South Carolina	12	7,382	62	148,919	21	239,537	2	133,671	97	529,509
South Dakota	49	51,252	44	81,500	10	128,466	0	0	103	241,218
Tennessee	10	7,936	57	142,084	23	218,382	4	700,087	94	1,068,489
Texas	72	53,545	258	605,063	91	988,007	11	1,580,396	432	3,227,011
Utah	6	4,427	23	55,905	7	950,990	1	149,934	37	161,256
Vermont	14	7,187	21	43,184	10	107,625	0	0	45	157,996
Virginia	28	17,190	59	140,080	24	348,065	5	514,446	116	1,019,781
Washington	40	26,582	54	590,725	17	249,010	3	599,711	114	1,466,028
West Virginia	66	39,300	82	166,985	22	259,298	3	207,849	173	673,432
Wisconsin	100	68,828	125	270,349	50	825,081	3	732,114	278	1,886,372
Wyoming	11	5,455	21	45,262	6	76,952	0	0	38	127,669
Total	1,848	1,216,010	3,670	8,901,959	1,766	27,034,869	200	41,752,988	7,484	78,905,826

TABLE 3.—*Number and population of incorporated communities with over 200 inhabitants for which new sewer systems with treatment are needed*

[Classified according to population]

State	Population range								Combined total	
	201–500		501–1,000		1,001–5,000		Over 5,000			
	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)
Alabama	72	23,498	46	30 377	19	24,595	3	25,933	140	104 403
Arizona			6	4 899	3	4,142		-	9	9,041
Arkansas	152	47,120	65	46,171	22	33 368			239	126,659
California	3	1,066	7	5,702	8	17,851	1	9,122	19	33,741
Colorado	77	22,595	25	17,164	9	12,599		-	111	52,358
Connecticut			3	1,915	9	22 189	3	27,347	15	51,451
Delaware	16	4,794	8	5,360	3	4,248			27	14,402
District of Columbia										
Florida	64	21 397	44	30,660	32	60,090	2	15,702	142	127,849
Georgia	187	59,174	96	63,440	25	29,280	1	12,155	309	164,049
Idaho	56	19,802	32	21,272	36	74 859			124	115,933
Illinois	407	124,529	226	155 940	87	130,121			720	410,590
Indiana	139	46,454	73	48,871	18	26,097			230	121,422
Iowa	309	99,178	99	66 174	8	9 590			416	174,942
Kansas	211	68,565	65	41,645	6	8 ^91			282	118,901
Kentucky	84	28,258	53	37 043	22	32,452			159	97,763
Louisiana	52	19 556	41	30,926	43	70,188	1	5,384	137	126,054
Maine										-
Maryland	31	10,103	23	18,208	13	23,183			67	51,494
Massachusetts		-						-		- -- -
Michigan	94	32,117	57	37,578	19	26 967	2	16,225	172	112,887
Minnesota	271	78 287	59	37,017	11	20 689			341	135,993
Mississippi	79	27,516	47	31 969	27	48 365			154	107,850
Missouri	273	89 274	100	68,661	33	51,039			405	208,974
Montana	26	8,504	17	11,090	3	4,389			46	23,983
Nebraska	190	60,756	31	19 515					221	80,271
Nevada										
New Hampshire										
New Jersey	17	6,342	27	19,505	77	186,589	2	10,682	123	223,118
New Mexico	9	2,717	5	3,941	4	5,184	1	6,421	19	18,263
New York	94	32,980	113	78 286	85	16,560	6	52,807	298	180,633
North Carolina	143	45,824	40	26,700	16	24,168			199	96,692
North Dakota	171	50,755	24	15,731	3	4,672			198	71,158
Ohio	207	70,719	98	66 143	24	39,203			329	176,065
Oklahoma	201	59,513	65	42,635	9	10,406			275	112,554
Oregon	63	19,167	22	15,178	9	11,678			94	46,023
Pennsylvania	175	57,748	140	98,978	125	263,096	20	145,183	460	565,005
Rhode Island							6	75,047	6	75,047
South Carolina	68	22,157	29	18,930	18	26,997			115	68,084
South Dakota	126	36,496	25	15,657	2	2,063			153	54,216
Tennessee	63	20,234	39	27,784	21	31,723			123	79,741
Texas	92	33,777	84	58,581	32	51,269			208	143,627
Utah	67	22,276	45	30,240	31	56,780			143	109,296
Vermont	14	3,943	8	5,498	3	5,266			25	14,707
Virginia	54	17,911	32	21,564	6	7,569			92	47,044
Washington	58	18,961	30	21,188	10	13,272			98	53,421
West Virginia	27	7,554	6	4,967	3	3,770			36	16,302
Wisconsin	138	44,718	60	40,452	10	15,325			208	100,495
Wyoming	24	6,977	4	2,966	3	3,413			31	13,356
Total	4,604	1,473,312	2,119	1,446,532	947	1,518,995	48	402,008	7,718	4,835,847

1 out of every 7 persons residing in such communities remains unconnected to an existing sewer system.

In the introductory section of this paper it has been noted that

the existing needs of the urban population for the treatment of raw sewage now being discharged through existing sewer systems present a considerably larger problem, as a whole, than the needs for additional sewerage facilities. In table 5, this greater need is reflected by the estimated total population, numbering 25,788,663, of some 2,804 incorporated communities which are not provided at present with any form of sewage treatment. This represents about 33 percent of the total population of the country inhabiting incorporated sewered communities and 31 percent of the total urban population, or nearly 1 out of every 3 persons living in incorporated communities. These figures serve to reemphasize the importance and magnitude of the task which remains to be met in the abatement of water pollution throughout the country.

In order to summarize the total figures given in tables 2 to 5, inclusive, for more ready comparison, table 6 has been prepared. In this table it is indicated that 10,522 communities in the country as a whole, with a combined population of some 30,000,000, are lacking in public sewer systems, or in sewage treatment plants, or in both combined. The needs in this respect are by far the greater in communities under 5,000, insofar as the number of new systems needed is concerned, though the need in terms of population to be served is about 2.7 times as great in communities of more than 5,000. With the total number and population of communities needing extensions

TABLE 4—*Number of communities and total populations for which extensions to existing sewer systems are needed*

State	Number of communities	Population	State	Number of communities	Population
Alabama	114	291, 600	New Hampshire	16	78, 100
Arizona	12	27, 900	New Jersey	69	110, 800
Arkansas	91	122, 500	New Mexico	.37	47, 800
California	183	1, 209, 400	New York	155	788, 200
Colorado	79	80, 400	North Carolina	220	269, 700
Connecticut	18	113, 900	North Dakota	73	45, 900
Delaware	14	27, 900	Ohio	381	506, 000
Florida	82	376, 000	Oklahoma	189	112, 100
Georgia	160	395, 800	Oregon	69	46, 500
Idaho	11	23, 700	Pennsylvania	291	460, 100
Illinois	341	538, 800	Rhode Island	13	82, 800
Indiana	259	376, 600	South Carolina	72	103, 100
Iowa	248	184, 600	South Dakota	49	21, 400
Kansas	128	153, 500	Tennessee	91	267, 700
Kentucky	113	145, 400	Texas	324	688, 000
Louisiana	61	160, 700	Utah	35	109, 000
Maine	24	89, 600	Vermont	12	12, 000
Maryland	53	114, 300	Virginia	75	110, 000
Massachusetts	96	392, 300	Washington	101	233, 600
Michigan	159	116, 500	West Virginia	129	93, 300
Minnesota	272	333, 100	Wisconsin	165	156, 900
Mississippi	92	139, 100	Wyoming	24	16, 600
Missouri	186	379, 900	District of Columbia	1	7, 500
Montana	51	35, 700			
Nebraska	108	92, 300	Total	5, 553	10, 297, 300
Nevada	7	8, 700			

TABLE 5.—*Number and population of incorporated communities with over 200 inhabitants for which new sewage treatment plants are needed in connection with existing sewer systems*

[Classified according to population]

State	Population range								Combined total	
	1,000 and under		1,001 to 5,000		5,001 to 50,000		Over 50,000			
	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)	Number of communities	Population (1940)
Alabama	5	3,417	43	107,142	15	213,945	2	156,084	65	480,588
Arizona			2	7,150	4	23,482			6	30,632
Arkansas	4	2,545	13	31,029	7	108,709	1	88,039	25	230,322
California	6	3,820	26	68,202	21	218,882	4	679,919	57	970,823
Colorado	26	15,169	25	56,810	5	37,449			56	109,428
Connecticut			2	6,042	5	75,481	1	99,314	8	180,837
Delaware			6	16,103			1	112,504	7	128,607
District of Columbia										
Florida	2	1,066	15	40,773	6	63,702	1	173,065	24	278,606
Georgia	5	3,436	44	121,342	15	149,672	4	273,060	68	547,510
Idaho			3	10,063	8	106,436			11	116,499
Illinois	9	4,480	45	109,036	18	227,448	1	75,608	73	416,572
Indiana	68	49,126	77	153,800	28	324,028	2	164,078	175	691,032
Iowa	24	15,993	36	80,506	11	234,390	1	82,364	72	413,253
Kansas	20	12,985	22	52,868	8	81,57[illegible]	1	121,458	51	268,887
Kentucky	15	10,726	48	101,329	13	183,903	2	381,185	78	677,143
Louisiana			11	32,862	10	148,753	2	592,704	23	774,319
Maine			6	18,857	17	239,057	1	73,643	24	331,557
Maryland	17	10,905	9	24,051	3	60,455			29	95,411
Massachusetts			4	16,600	56	1,074,984	13	1,814,002	73	2,905,586
Michigan	56	36,628	84	193,973	27	390,252			167	620.853
Minnesota	46	27,492	38	78,577	12	116,488			96	222,557
Mississippi	10	6,484	30	77,365	16	232,804	1	62,107	57	378,760
Missouri	4	3,024	28	57,625	16	151,016	3	1,290,937	51	1,502,602
Montana	1	876	17	39,006	8	147,848			26	187,730
Nebraska	28	20,176	52	99,276	10	94,785	1	223,844	91	438,081
Nevada	1	830	1	4,140					2	4,970
New Hampshire			2	8,498	12	157,582	1	77,685	15	243,765
New Jersey	1	906	3	7,563	13	180,240	4	486,659	21	675,368
New Mexico	8	2,154	1	1,446	3	20,222			7	23,822
New York	13	9,877	43	116,125	27	402,252	3	249,131	86	777,385
North Carolina	20	11,043	46	105,165	15	215,443	1	51,310	82	382,961
North Dakota	5	3,560	5	7,399	3	27,971			13	38,930
Ohio	78	55,703	96	203,643	37	584,552	2	218,312	213	1,062,210
Oklahoma	6	2,716	16	38,234	9	114,328			31	155,278
Oregon	14	9,333	26	93,939	6	57,663	1	305,394	47	466,329
Pennsylvania	48	34,305	168	436,053	117	1,331,225	7	2,707,803	340	4,509,386
Rhode Island					7	105,579			7	105.579
South Carolina	2	1,513	13	41,882	6	51,025	2	133,671	23	228,091
South Dakota	18	11,480	11	26,472	1	6,798			30	44,750
Tennessee	5	3,480	20	44,302	13	148,106	4	700,084	42	895,972
Texas	3	2,153	3	1,919	4	84,700	2	119,923	12	208,695
Utah	4	3,234	9	18,572	5	84,482	1	149,934	19	256,222
Vermont	12	6,224	21	43,184	9	99,588			42	148,996
Virginia	10	6,419	38	92,538	18	258,657	4	457,406	70	815,020
Washington	21	11,948	27	67,860	14	197,736	3	599,711	65	877,255
West Virginia	63	36,032	70	142,394	20	226,205	3	207,849	156	612,480
Wisconsin	9	6,905	31	71,105	7	101,762			47	179,772
Wyoming	4	1,860	14	29,403	3	45,969			21	77,232
Total	686	450,023	1,350	3,202,223	688	9,207,630	80	12,928,787	2,804	25,788,663

TABLE 6.—*Total number and population of communities for all States combined, as given in tables 2, 3, 4, and 5*

	Population range					
	Under 5,000		Over 5 000		Combined	
	Number of communities	Population	Number of communities	Population	Number of communities	Population
(1) With existing sewer systems	5,518	10,117,959	1,966	68,787,857	7,484	78,905,826
(2) New sewer systems needed, with treatment	7,670	4,433,839	48	402,008	7,718	4,835,847
(3) New sewage treatment plants needed (for existing systems)	2,036	3,652,246	768	22,136,417	2,804	25,788,663
(4) Sewer extensions needed					5,553	10,297,300
Total communities requiring new treatment [Sum of (2) and (3)]	9,706	8,086,085	816	22,538,425	10,522	30,624,510
Total communities requiring some type of sewerage need	...	...	...	...	13,915	[1] 40,500,000

[1] Estimated from totals in tables 2, 3, and 4, corrected for number of communities having adequate facilities and number omitted because of having less than 200 inhabitants

to existing sewer systems added to those needing new installations, 13,915 out of 16,752 communities in the United States are shown to present some type of need involving additional sewerage or sewage treatment. The difference between these two figures is represented by the sum of 1,537 communities with under 200 inhabitants, not included in this inventory, and 1,300 communities now having systems which are adequate.

COSTS OF FULFILLING NEEDS

In estimating the costs of fulfilling the several needs enumerated in the previous tabulations, the general method followed has been to apply to the population of each separate community needing a particular type of facility a per capita cost figure based on the most authentic construction cost data available, thus deriving an estimated total cost figure for this facility in that community. As the per capita cost data thus used have been based on construction figures covering the years 1933–39, inclusive, these figures have been averaged for that period and finally increased by 32 percent in order to bring them up to the 1942 cost level in accordance with the relation shown by general construction cost indices of the Engineering News-Record.

In making these estimates, three different sources of cost data for the period 1933–39 have been available, namely, (1) an analysis of construction costs for sewage treatment works carried out in connection with the preparation of a recent report on the Ohio River Pollution Survey, (2) detailed cost data on 289 Public Works Administration sewerage and sewage treatment projects as given in Bulletin No. 104, Federal Works Agency, entitled "Public Works Administration Non-Federal Sewage Disposal Projects," and (3) detailed

engineering estimates for post-war construction from State and local agencies. In all cases where actual engineering cost data have been made available from individual cities, these data have been used for those communities in preference to information derived from other sources.

As a basis of estimating the costs of sewer extensions and new sewer systems, an analysis has been made of the 289 Public Works Administration projects above noted under item 2. This study has indicated that the per capita cost of new sewer systems with treatment included and also that of new treatment plants alone tend to diminish with increasing numbers of population served, but at a decreasing rate. The two curves approach their respective minimum asymptotes with populations ranging over 10,000. The difference between these two curves, which is a measure of the cost of sewer systems without treatment plants, tends to remain fairly constant, however, at all ranges of population. This difference, which averages $31 per capita, has been taken as representing the per capita cost of sewer systems at the 1933–39 price level. When increased by 32 percent to bring it up to the 1942 level, this figure becomes $41 per capita, which has been used for both sewer extensions and new systems as above indicated.

For intercepting sewers, the unit cost assumed has been $5 per capita for communities with 1940 United States Census populations under 10,000 and $10 per capita for communities of over 10,000. These unit costs were developed in connection with the Ohio River Pollution Survey as a basis of estimates for the construction of intercepting sewers leading to treatment plants in communities of the Ohio River Basin. As applied to the present inventory, they have been increased by 32 percent in order to bring them up to the 1942 price level.

Estimation of per capita costs of sewage treatment has been based on two relationship curves developed from the Ohio River Survey, one showing the population served as related to the per capita cost of primary sewage treatment, and the other the population served as related to the per capita cost of secondary treatment. As the type of treatment, i. e., primary or secondary, has not been capable of definite predetermination in the present inventory a mean curve representing the averages of the ordinates of the two curves has been used for these estimates.

The mean curve thus derived has been applied in estimating for three types of sewage treatment needs: (1) new sewage treatment plants for sewered communities, (2) new treatment plants for communities not at present sewered, but to be provided with new sewer systems, and (3) improvements and extensions to existing treatment plants. In applying this cost population curve, advantage has been

taken of the fact that the costs on which it is based include an item for excess of design population over census population (from 10 to 20 percent) and an item for engineering, land, and other miscellaneous costs (15 percent). As in the estimates for sewer construction, the costs obtained by this method have been increased by 32 percent to bring them up to the 1942 price index level.

INDUSTRIAL WASTES

Industrial wastes may be handled by treatment at the municipal plant with domestic sewage, or by independent industrial waste corrective measures. Although no estimates for costs of industrial wastes treatment have been practicable for individual communities in connection with the present inventory, it has been possible to make an approximate estimate on a State basis by applying experience gained in the Ohio River Survey. This has involved (1) increasing the total sewage treatment costs as estimated for each State by 21 percent, in order to allow for the added cost of treating industrial wastes with sewage, and (2) adding an item of 22 percent of net sewage treatment costs (before applying the 21 percent increase as above) for the cost of independent industrial wastes treatment. The Ohio River Survey figures for independent industrial waste treatment included only practical and proven treatment or other corrective measures. Costs for development and installation of corrective processes are not now known and not included. For this reason total costs of correcting industrial waste pollution as shown in this inventory represent amounts which can be spent without extensive study and are not ultimate costs. Furthermore, costs of rearranging sewers cannot be estimated and are not included.

RESULTS OF COST ESTIMATES

The results of the estimates of cost involved in fulfilling each need for sewers and sewage treatment (the latter representing cost of pollution abatement) are presented in table 7, in thousands of dollars for each State and the District of Columbia. The estimated total cost of the entire program amounts to $2,255,150,000, of which $656,190,000, or 29 percent, represents the cost of new sewer systems and extensions, $559,160,000 (25 percent) the cost of intercepting sewers incidental to the addition of treatment works to existing sewer systems, and the remaining $1,039,800,000 (46 percent) the cost of sewage and industrial wastes treatment.

On referring to table 7, it will be noted that the total cost of sewage treatment, when added to that of new intercepting sewers, amounts to 57 percent of the total cost of the entire program. Industrial wastes treatment, both separately and in combination with sewage treatment, accounts for an additional 14 percent of this total cost.

As each one of these items, including intercepting sewers, is a major element in the total cost of water pollution abatement, it may be said that the total cost of such an abatement program would amount to $1,598,960,000, or roughly 70 percent of the total cost of the entire program.

TABLE 7.—*Total estimated costs, in thousands of dollars, of fulfilling needs for sewers, sewage treatment, and industrial wastes treatment in each State*

States	Sewers		Municipal treatment			Independent industrial waste correction	Combined total
	New systems and extensions	Interceptors	Domestic sewage	Industrial wastes	Total		
Alabama	$16,240	$5,490	$11,280	$2,370	$13,650	$2,480	$37,860
Arizona	1,510	210	950	200	1,150	210	3,080
Arkansas	10,220	2,610	9,650	2,030	11,680	2,120	26,630
California	50,970	33,470	32,610	6,850	39,460	7,170	131,070
Colorado	5,440	810	5,610	1,180	6,790	1,230	14,270
Connecticut	6,780	2,660	5,310	1,110	6,420	1,170	17,030
Delaware	1,730	1,520	2,110	440	2,550	460	6,260
District of Columbia	8,580	8,580	6,600	[1] 1,390	7,990	[1] 1,450	26,600
Florida	20,660	7,440	12,540	2,630	15,170	2,760	46,030
Georgia	22,950	6,460	16,950	3,560	20,510	3,730	53,650
Idaho	5,720	1,400	5,030	1,[illegible]	6,090	1,110	14,320
Illinois	43,920	12,280	51,360	10,780	62,150	11,300	129,650
Indiana	20,420	13,040	20,890	4,390	25,280	4,600	63,340
Iowa	14,740	4,580	16,690	3,510	20.200	3,670	43,190
Kansas	11,170	2,850	10,040	2,110	12,150	2,210	28,380
Kentucky	9,970	12,780	11,930	2,500	14,430	2,620	39 800
Louisiana	11,760	9,760	11,200	2,350	13,550	2,460	37,530
Maine	3,670	4,310	4,260	890	5,150	940	14,070
Maryland	12,170	13,520	5 790	1,220	7,010	1,270	33,970
Massachusetts	16,080	48,090	37,220	7,820	45,040	8,190	117.400
Michigan	9,400	15,510	14.100	2,960	17,060	3,100	45,070
Minnesota	19,240	1,950	12,540	2,630	15,170	2,760	39,120
Mississippi	10,120	4,030	9,970	2,090	12,060	2,190	28,400
Missouri	24,140	18,770	27,250	5,720	32,970	6,000	81,880
Montana	2,450	2,130	4,180	880	5,060	920	10,560
Nebraska	7,080	3,980	10,300	2,160	12,460	2,270	25,790
Nevada	360	30	230	50	280	50	720
New Hampshire	3,200	3,060	3,200	670	3,870	700	10,830
New Jersey	13,690	9,750	13,830	2,900	16,730	3,040	43,210
New Mexico	2,710	100	1,240	260	1,500	270	4,580
New York	39,720	74,620	96,430	20,250	116,680	21,210	252,230
North Carolina	15,020	6,160	15,290	3,210	18,500	3,360	43,040
North Dakota	4,800	360	5,460	1,150	6,610	1,200	12,970
Oklahoma	8,610	1,800	12,150	2,550	14,700	2,670	27,780
Ohio	33,860	37,520	37,810	7,940	45,750	8,320	125,450
Oregon	3,790	8,980	7,470	1,570	9,040	1,640	23,450
Pennsylvania	53,840	102,510	80,870	16,980	97,850	17,790	271,990
Rhode Island	6,470	2,040	2,410	510	2,920	530	11,960
South Carolina	7,020	2,650	6,860	1,440	8,300	1,510	19,480
South Dakota	3,100	300	4,230	890	5,120	930	9,450
Tennessee	14,250	25,340	13,690	2,870	16,560	3,010	59,160
Texas	34,100	2,860	11,210	2,350	13,560	2,470	52,990
Utah	8,950	3,200	7,200	1,510	8,710	1,580	22,440
Vermont	1,090	1,310	3,070	640	3,710	670	6,780
Virginia	6,440	15,130	15,750	3,310	19,060	3,460	44,090
Washington	11,770	10,960	11,720	2,460	14,180	2,580	39,490
West Virginia	4,490	9,850	11,390	2,390	13,780	2,510	30,630
Wisconsin	10,550	1,680	7,290	1,530	8,820	1,600	22,650
Wyoming	1,230	720	2,020	420	2,440	440	4,830
Total	656,190	550,160	727,180	152,690	879,870	159,930	2,255,150

[1] An estimate, based on the same percentage of total sewage treatment cost as applied to similar estimates for individual States. Probably somewhat in excess of the true figure, because of the lower degree of industrial development in the District of Columbia.

With reference to sewage and industrial wastes treatment, the results of the estimates indicate that sewage treatment alone would account for about 70 percent of the total cost, with the remaining 30 percent chargeable to industrial wastes treatment. It is quite probable that this proportion of cost for industrial wastes treatment may be unduly low, as experience with this phase of the problem has not been thus far sufficiently extensive over the entire country to reveal all of the elements of cost which may be involved in any far-reaching program of eliminating industrial wastes pollution. Possible compensating elements may be the recovery of valuable by-products from the diversion and treatment of industrial wastes, together with the fact that industrial wastes treatment plants usually are of relatively inexpensive construction and seldom need to be built with capacities materially in excess of present requirements. Economies of this type would tend to reduce the net cost of any general program directed toward correction of industrial pollution, though they cannot be considered with any degree of assurance, for the reason above noted.

As these estimates have been based to a large extent on a consideration of the needs of individual communities for the several facilities included in the inventory, some degree of variation would be expected in the relative needs for particular facilities among the different States, in which a wide diversity is to be found in such matters as amount and trend of urbanization, industrial development, and the proportion of small towns and large cities, respectively, in the individual States. An examination of table 7 does reveal such a tendency, though perhaps not as great as might be expected In Massachusetts, for example, which is an old State with a long history of urban and industrial development, only 14 percent of the combined needs for sewage facilities are indicated as being for new sewer systems or extensions, in contrast to 29 percent for the country as a whole and to 39 percent in California, a young State undergoing rapid expansion in urban growth and industrialization. In some of the States which have been largely rural, but have undergone recent industrialization, relative needs for sewage and industrial wastes treatment are shown to be somewhat greater than for the country as a whole. Despite these tendencies, a large majority of the States appear to follow quite closely the general pattern of distribution for all of the States combined. It may be said, therefore, that in general the needs for each and every facility enumerated in this inventory are to a very large extent national in scope and not confined to any particular areas or groups of States.

METHODS OF FULFILLING NEEDS

In the first paper (*8*) of this series, it has been shown that the fulfillment of needs for the improvement and extension of public water

supplies can be accomplished, in general, on a completely self-liquidating basis by the local communities, with technical aid from the States, where needed, and financial assistance from the State and Federal governments in the form of low interest-bearing loans amortized over a suitable period of years. In many instances, such improvements are financed through bond issues, similar to those of other revenue-producing public utilities. As water is an essential commodity, sold to individual consumers, the cost of developing and improving a water supply is borne directly by the consumers alone and tends to be distributed automatically among them in proportion to the benefits received. In this connection, it should be noted that the sole, or at least the chief, beneficiaries of water-supply improvements are the local consumers who pay for the water as delivered to them.

Improvements and extensions of public sewerage systems are in much the same general category as are public water-supply betterments, in that the chief beneficiaries are local users of the systems and thus may justly share in the expense of such improvements. In States having sewer rental and other similar laws, citizens connected to sewer systems may be charged for this particular service on substantially the same basis as users of a public water system. In 1939, according to Sweeney (*11*), 600 municipalities in 35 States had adopted sewer rental laws.

In a recent book (*12*), Keefer has reviewed briefly the methods followed in charging for sewerage service under the sewer rental plan. One widely used method is to base the charge on the quantity of water used, sometimes on a graduated scale with decreasing rates as water consumption increases. Sewerage charges are also based on the number and type of plumbing fixtures in a house, the foot frontage or the type of property, the strength and character of the sewage, and a flat rate for each house, with corresponding rates for apartment houses, industries, and other kinds of property. Bills, prepared separately or with the water bill, are rendered annually or more frequently. Childs and Schroepfer (*13*) have summarized the rates in 58 municipalities. These rates are given by Keefer (*12*), who notes that the practical advantage of direct charges for sewerage service are (1) that sufficient funds are provided for operating and maintaining the sewerage system, and (2) that each property owner pays more nearly in proportion to the service received.

The aforesaid remarks have particular reference to local methods of financing sewerage improvements. The larger problem of water pollution abatement on a Nation-wide scale involves legal and technical, as well as financial, implications and problems which in many instances extend far beyond local boundaries. For this reason, the general problem of providing adequate treatment of sewage and industrial wastes in order to restore and maintain the normal uses of

the Nation's waterways for health and food conservation, recreation, navigation, industry, and other essential purposes, is one which involves consideration of many elements other than local financing.

It is beyond the scope of this paper to discuss these matters except very briefly. Some of their more important legal and governmental aspects have been covered very fully and ably by recent commentators, notably by Baity (*14*), who has pointed out that "the use of a natural watercourse for the reception of liquid wastes is as necessary and legitimate as its use for any other purpose, subject to definite limitations." After reviewing efforts toward Federal legislation and recent progress in water pollution abatement, Baity notes the Federal-State pattern of cooperation which has been developed within the past 50 years in all matters pertaining to public health, whereby the United States Public Health Service has provided (a) research services to develop scientific facts and procedures, (b) safe and uniform standards, (c) guidance in methods and procedures, and (d) financial assistance, the responsibility for legislation and administration of the programs being left to the States. The author concludes his discussion with a statement of principles relating to the administration of a national plan of water pollution abatement which includes, among others, the following points:

1. Natural waterways supply various important needs within their drainage basins and those uses must be considered and balanced.
2. One of the natural and inescapable uses of streams is for the reception and ultimate disposal of wastes, after such treatment as may be required.
3. The self-purification capacities of natural watercourses must be utilized to a greater or less degree in all cases, alone or as an adjunct to treatment processes.
4. The most important factors in pollution abatement are related to public health.
5. A national pollution abatement program should be carried out in cooperation with State health agencies along the lines of the Federal-State pattern, which has been found so effective in other similar undertakings.
6. With a national campaign conducted under such a plan, and with reasonable availability of Federal funds for loans and grants-in-aid, the future progress in pollution abatement should be comparable to that of the years 1933–38, when, under the stimulus of Federal aid, more progress was made than during the preceding 25 years.

In a recent paper Velz (*15*) has stressed the great importance of intelligent advance planning for pollution abatement, in order to avoid the adoption of hastily conceived and poorly balanced projects. In this connection, he draws a parallel between a watercourse in which pollution control has been poorly planned and a highway consisting of "alternate sections of beautiful hard pavement, old dirt road, one-lane pavement, and good road, ending in a mud hole." He points out also the importance of approaching the problem of industrial wastes, not as a separate one to be solved after all municipal sewage pollution has

been abated, but as a combined problem of industry and the municipality to be worked out jointly with a view to combining the treatment of sewage and industrial wastes wherever possible. As examples of successful joint cooperation of this type he cites the Elizabeth and Rahway Valley joint meeting projects and the Passaic Valley Sewerage Commission plan, both in New Jersey.

The two papers by Baity and Velz supplement each other in affording an admirable composite view of the Federal-State and the State-local approaches toward a solution of the problem. Their conclusions may be summarized very briefly as advocating (1) Federal aid through financial assistance where needed, the development of sound technical methods and standards, and active cooperation with the States in working out well-balanced programs of pollution abatement, (2) State regulation of local pollution, with assistance to local communities, and (3) local responsibility for carrying out detailed projects for sewage treatment, sometimes jointly with industries and neighboring communities.

On the basis of the figures given in table 7, construction work in the amount of $225,500,000 would need to be accomplished annually if the entire program of sewerage improvements and extensions, including sewage treatment, were to be completed in a 10-year period. Spreading the work over a longer period would reduce correspondingly the annual volume of construction required.

An approximation as to the annual payments which would be required to finance a total capital expenditure of $2,255,000,000 may be made by the application of the usual formula for liquidating a given capital sum by equal annual payments over any given period of time at any assumed rate of interest. According to this formula, the annual payment (Y) required to liquidate a capital sum (C) in (n) years at an interest rate of (r), as a decimal, is $Y=\frac{Cr}{(1+r)^n-1}$.

If it be assumed, for purposes of illustration, that construction costs are to be financed by the issuance of 20-year bonds, bearing 3 percent interest, the annual payment required to liquidate an initial capital expenditure of $2,255,000,000 would amount to 6.7222 percent of the original capital sum, or $151,600,000, over the 20-year period.

The true annual financing cost of a capital expenditure, however, is not determined by the term of bond or other indebtedness payment but rather by spreading the capital cost over the useful life of the structure or improvement for which the capital expenditure was incurred. Thus, if in the formula noted above, (n) be taken as the estimated annual life of the structure or improvement, the annual payment (Y) for (n) years would result in the liquidation of the original capital investment at the end of the useful life of the physical improvement. Presumably, the physical improvement would then

require replacement and the annual payment (Y) would be continued on the renewed capital expenditure.

On this basis, estimate may be made of the true annual financing cost of the proposed sewerage improvement program. The useful life of various parts of a sewerage system will vary widely; for intercepting sewers an assumed useful life of 40 to 50 years probably would not be excessive, whereas the useful life of certain mechanical and equipment items may be less than 20 years. It is believed that the assumption of an average useful life of 30 years would be conservative; utilization of this figure and an interest rate of 3 percent would result in an estimated annual financing cost of 5.102 percent of the total required capital expenditure, or $115,000,000 per year for the entire $2,255,150,000 program herein outlined. Similarly, an annual financing cost of $81,500,000 would be involved in that portion of the entire program which is involved directly in pollution abatement. If to this latter figure there is added the estimated annual operating and maintenance costs, approximating $35,000,000, of the works which would be involved in the abatement of the existing pollution, a total estimated cost of $116,500,000 is obtained. The annual cost of present water pollution may be conservatively estimated at $100,000,000 per year, on the basis of its total economic damage, and the saving of this amount would very nearly pay the entire cost of the abatement program. From this standpoint, pollution abatement as a national project would be practically self-liquidating from a financial viewpoint and its intangible benefits probably would greatly exceed any economic benefits which might be conceived.

From the standpoint of providing a backlog of employment for public works, sewerage and water pollution abatement projects are fully as important in the public interest as public water supply improvements. Projects of this type, being designed for community sanitation, are in many States exempt from the usual bond-limit restrictions of municipalities. They can be carried out either as combined undertakings for groups of communities or as single projects forming part of a combined plan. In this respect they are entirely flexible. Because of the very large measure of public interest involved in water pollution abatement, Federal and State aid in financing such projects is justifiable to fully the same extent as is true of other forms of public works improvements affecting large areas of the country. The importance of detailed planning in advance cannot be too greatly stressed, however, as a large amount of careful engineering surveys and estimates must be completed before any construction work can be started. In such planning, the Federal and State governments have a definite responsibility, but the detailed projects must finally be carried out by the local communities. Close

cooperation between all three of these authorities will be essential to any well-coordinated action, which otherwise could be wasteful and ineffective. To this task should be dedicated some of the best technical and legal resources of the Federal and State health agencies in the near future, as the main burden of responsibility will rest on these agencies for taking the lead toward effective action.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

May 21–June 17, 1944

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended June 17, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—The number of cases of meningococcus meningitis dropped from 1,636 during the preceding 4-week period to 1,167 for the 4 weeks ended June 17. The incidence was about 25 percent below that for the corresponding period in 1943, but it was almost 8 times the 1939–43 median. Only the East North Central and South Central regions reported a higher incidence than in 1943, but all regions continued to report excesses over the medians. Since the epidemic peaks occur at intervals of 7 to 10 years, the 5-year medians at this time usually represent the lower interepidemic years. The current epidemic of this disease has been the greatest during the nearly 40 years covered by reports to the United States Public Health Service. This epidemic has been in progress since 1941 and has appeared in all sections of the country. It is probable that the peak for the country as a whole was reached in 1943, since the three preceding epidemics with peaks in 1917–18, 1929–30, and 1936–37 were accompanied by relatively high rates for one or two years on either side of the peak year. In some sections of the country, however, the peak was not reached until 1944. Since the beginning of the year 1944 there have been 11,446 cases reported, as compared with 11,431 for the same weeks in 1943. A decline in the number of cases was reported from each section during the current 4-week period, with the present level somewhat below that of the corresponding period in 1943.

Poliomyelitis.—For the 4 weeks ended June 17 there were 198 cases of poliomyelitis reported. The 1939–43 median for the corresponding weeks was 179 cases. Of the total cases, California reported 27, Louisiana 26, North Carolina and New York 20 each, Wisconsin 14, Kentucky 11, Mississippi 8, and Alabama and Ohio 7 cases each. No more than 5 cases were reported from any other State. Under date of June 20 there were 39 delayed cases reported from North Carolina, chiefly in Catawba, Caldwell, and Gaston Counties. An increase in this disease is normally expected at this season of the year.

The rate of increase during the current period was somewhat higher than the rate of increase during nonepidemic years.

Scarlet fever.—The number of cases of scarlet fever dropped from 25,698 during the 4 weeks ended May 20 to 14,210 during the current 4-week period. The incidence was, however, about 40 percent above the normal seasonal incidence (approximately 10,000 cases) and for the country as a whole was the highest incidence recorded since 1937, when about 17,000 cases were reported for these 4 weeks. Each section of the country contributed to the relatively high incidence of this disease, but the greatest excesses over the preceding 5-year median were reported from the Mountain and Pacific regions; the smallest excess (10 percent) was reported from the East South Central region.

Rocky Mountain spotted fever.—For the 4 weeks ended June 17 there were 81 cases of Rocky Mountain spotted fever reported, as compared with 63, 88, and 97 for the corresponding period in the years 1943, 1942, and 1941, respectively. Of the 81 cases reported for the current period, 44 occurred in the South Atlantic region, as compared with 26 in 1943, 22 in 1942, and 34 in 1939. During the current period, Maryland reported 15 cases, Virginia and Wyoming 9 each, North Carolina 8, New York and Colorado 5 each, New Jersey and West Virginia 4 each, and 12 other States reported from 1 to 3 cases each. The other 29 States reported no cases, including none in the whole of the New England, East North Central, and Pacific regions, and only 1 case in the West North Central section. Since the beginning of the year there have been 112 cases reported in the country as a whole, as compared with 133, 165, and 208 for the same period in the 3 preceding years.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended June 17 there were 676 cases of diphtheria reported, as compared with 703 in the corresponding period of 1943 and a preceding 5-year median of 767 cases. Significant increases in the number of cases occurring were reported from the West South Central, Mountain, and Pacific regions; in the New England and West North Central sections the incidence was about normal, but in all other sections the number of cases dropped considerably below the seasonal expectancy.

Influenza.—For the country as a whole the incidence of influenza was also below the normal seasonal level during the current 4-week period; 2,854 cases being reported, as compared with a 1939–43 median of 3,236 cases. A comparison of geographic regions shows a relatively high incidence in the New England and East and West South Central sections, but in all other sections the numbers of cases were considerably below the medians.

Measles.—The number of cases (59,394) of measles reported for the 4 weeks ended June 17 was about 70 percent of the number reported for the corresponding period in 1943, but it was only about 5 percent below the median seasonal level. The East North Central, South Atlantic, West South Central, and Pacific sections reported considerable increases over the 1939–43 medians, but in the other 5 regions the incidence was comparatively low.

Smallpox.—The incidence of smallpox reached a new low level for this season of the year. For the current 4-week period there were 25 cases reported, slightly more than one-half of the number of cases reported for the corresponding period in 1943, and less than 20 percent of the preceding 5-year median. The situation was favorable in all sections of the country.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period May 21–June 17, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43

Division	Current period	1943	5 year median	Current period	1943	5 year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	676	703	767	2,854	3,636	3,236	59,394	88,677	62,904
New England	14	12	13	55	11	10	6,170	8,822	7,291
Middle Atlantic	90	94	140	15	45	36	8,342	26,995	10,115
East North Central	85	165	153	82	180	226	11,186	31,697	8,748
West North Central	45	46	51	14	74	43	3,114	5,904	4,496
South Atlantic	104	108	119	760	958	972	6,547	4,621	4,621
East South Central	33	42	47	198	153	167	919	1,382	1,265
West South Central	143	109	106	1,386	1,532	884	7,200	1,427	2,637
Mountain	54	43	43	229	467	329	1,839	2,789	2,789
Pacific	108	84	81	115	216	216	14,07[illegible]	5,040	5,040
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	1,167	1,582	152	198	239	179	14,210	10,123	10,056
New England	70	161	14	5	7	3	1,415	2,061	905
Middle Atlantic	282	494	58	24	10	11	3,213	2,480	2,816
East North Central	286	237	19	13	6	9	4,376	2,588	3,041
West North Central	90	95	7	5	5	5	1,258	669	700
South Atlantic	120	257	25	[3] 44	10	15	1,065	504	504
East South Central	93	67	15	29	4	9	278	170	244
West South Central	87	58	19	43	62	10	362	175	171
Mountain	16	68	5	6	13	6	639	745	197
Pacific	123	145	12	29	122	38	1,604	731	589
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	25	43	144	411	374	513	7,443	16,483	15,027
New England	0	0	0	23	24	24	488	938	1,359
Middle Atlantic	0	1	0	36	56	74	978	2,484	3,011
East North Central	5	17	51	35	35	47	1,061	3,115	3,288
West North Central	4	5	43	23	22	31	418	1,009	655
South Atlantic	0	2	4	86	106	125	1,676	3,420	2,160
East South Central	7	3	20	53	32	47	518	622	632
West South Central	3	10	25	86	72	116	1,110	2,493	1,581
Mountain	5	2	7	23	11	15	717	576	643
Pacific	1	3	4	46	16	32	477	1,826	1,826

[1] Mississippi and New York excluded, New York City included
[2] Mississippi excluded
[3] 39 additional delayed cases were reported under date of June 21 in North Carolina.

Typhoid and paratyphoid fever.—The number of cases (411) of this disease reported during the current 4-week period was about 10 percent above the number reported during the same weeks in 1943, but it was about 20 percent below the 5-year median level. Slight increases over the normal incidence were reported from the West South Central, Mountain, and Pacific sections, but in other sections the incidence either closely approximated the median or fell considerably below it.

Whooping cough.—For this disease the number of cases (7,443) was the lowest reported for this period in the 7 years for which these data are available. The situation was favorable in all sections of the country except the Mountain; there the incidence was slightly above the seasonal expectancy.

MORTALITY, ALL CAUSES

For the 4 weeks ended June 17 there were 33,724 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average for the corresponding period in the 3 preceding years was 33,358 deaths. A comparison of geographic regions shows that the deaths were higher than the 3-year average in the New England, North Central, East South Central, and Pacific regions, about the same as the average in the Middle Atlantic, West South Central, and Mountain regions, and low in the South Atlantic region. For the country as a whole the number of deaths was about 3 percent higher than the 3-year average during the first and fourth weeks of the current period and slightly lower than the average in the second and third weeks; the average increase for the 4 weeks was 1.1 percent.

INCIDENCE OF HOSPITALIZATION, MAY 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

Item	May	
	1943	1944
1. Number of plans supplying data	68	71
2. Number of persons eligible for hospital care	9,935,638	13,430,075
3. Number of persons admitted for hospital care	82,446	120,375
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	100.8	100.6
5. Incidence per 1,000 persons, annual rate for the 12 months ending May 31	106.4	104.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 1, 1944

Summary

Of a total of 222 cases of poliomyelitis reported for the current week, as compared with 126 last week and 79 for the 5-year median, 138 cases, or 62 percent, occurred in 3 States, as follows (last week's figures in parentheses): North Carolina 84 (42), Kentucky 29 (17), and New York 25 (9). California reported 13 cases, Pennsylvania, Ohio, Virginia, and Florida 6 each, and Minnesota, Texas, and Oregon 5 each. For the corresponding week last year a total of 190 cases was reported, 80 of which were in Texas, 57 in California, and 23 in Oklahoma. The cumulative total to date this year is 1,044, as compared with 1,084 for the same period last year and a 5-year median of 776.

The decline in the incidence of meningococcus meningitis continued. A total of 180 cases was reported, as compared with 219 last week and 246 for the next earlier week. The corresponding 5-year median is 36. States reporting the largest numbers are New York (27), California (22), Michigan (12), and Texas (11). For the year to date 11,842 cases have been reported, as compared with 12,011 for the same period last year.

A total of 111 cases of typhoid fever was reported, as compared with 104 last week, 141 for the corresponding week last year, and a 5-year median of 195. Of the current total, 21 cases were reported in Texas, 9 in Georgia, 7 in Arkansas, and 6 in California. The cumulative total to date is 2,115, as compared with 1,807 for the period last year and a 5-year median of 2,498.

Of a total of 26 cases of Rocky Mountain spotted fever, 17 occurred in the South Atlantic area. A total of 170 cases has been reported to date this year, as compared with 186 for the corresponding period last year.

Of 118 cases of typhus fever reported for the week, 49 were in Texas, 26 in Georgia, and 19 in Alabama. For the corresponding week last year 82 cases were reported. The cumulative total to date is 1,413, as compared with 1,286 last year.

Deaths recorded for the week in 93 large cities of the United States totaled 8,473, as compared with 8,557 last week and a 3-year (1941-43) average of 8,353. The cumulative total is 247,443, as compared with 253,902 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended July 1, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, Meningococcus		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943	
NEW ENGLAND												
Maine	0	0	0	---	---	---	111	111	95	1	3	0
New Hampshire	0	0	0	---	2	---	9	6	6	0	0	0
Vermont	0	0	0	---	---	---	1	148	80	0	1	0
Massachusetts	1	0	1	---	---	---	457	738	738	4	14	1
Rhode Island	0	0	0	---	---	---	20	110	60	0	3	0
Connecticut	0	1	0	---	---	---	141	190	190	7	5	1
MIDDLE ATLANTIC												
New York	7	7	13	[1] 3	[1] 3	[1] 3	609	1,912	869	27	51	5
New Jersey	2	3	3	4	1	3	344	1,310	711	5	16	2
Pennsylvania	4	20	7	---	3	---	182	390	260	6	14	3
EAST NORTH CENTRAL												
Ohio	4	10	7	3	2	4	35	327	90	6	4	1
Indiana	1	1	4	3	9	6	25	109	37	2	1	0
Illinois	3	11	15	2	11	11	[illegible]	602	185	6	10	0
Michigan [2]	7	6	5	---	1	---	[illegible]	1,158	692	12	17	1
Wisconsin	1	1	1	3	9	9	644	1,245	793	4	1	1
WEST NORTH CENTRAL												
Minnesota	11	1	4	---	2	1	67	266	66	5	3	0
Iowa	1	0	1	---	---	2	45	125	64	2	0	0
Missouri	1	0	1	1	1	---	23	71	31	5	6	1
North Dakota	0	0	0	---	---	---	0	52	9	0	0	0
South Dakota	0	1	0	---	---	---	1	47	6	0	0	0
Nebraska	1	0	1	---	---	---	20	22	13	1	1	1
Kansas	3	2	2	---	2	---	63	69	69	6	3	1
SOUTH ATLANTIC												
Delaware	0	0	0	---	---	---	0	6	4	1	1	0
Maryland [2]	4	2	1	---	5	1	42	120	65	8	5	3
District of Columbia	0	0	0	---	---	---	30	55	55	0	2	0
Virginia	5	4	5	56	70	42	134	61	115	5	15	3
West Virginia	2	0	2	2		4	50	31	31	2	4	0
North Carolina	4	4	4	---	37	1	122	147	147	3	4	2
South Carolina	6	6	6	106	90	80	144	26	26	2	5	0
Georgia	3	4	4	3	2	3	11	63	25	1	4	0
Florida	3	2	2	1	8	---	46	11	22	4	3	0
EAST SOUTH CENTRAL												
Kentucky	0	0	3	5	1	2	31	20	20	6	0	1
Tennessee	1	2	2	4	1	5	11	35	35	1	4	0
Alabama	2	1	6	16	6	3	16	124	62	3	1	0
Mississippi [2]	3	1	2	---	---	---	---	---	---	1	0	0
WEST SOUTH CENTRAL												
Arkansas	1	0	2	27	---	1	33	23	23	0	0	0
Louisiana	7	4	4	4	2	2	8	29	15	1	7	0
Oklahoma	0	1	1	12	6	9	45	9	35	2	1	0
Texas	30	15	11	249	314	135	442	156	156	11	3	1
MOUNTAIN												
Montana	5	0	0	---	6	---	15	96	35	1	0	0
Idaho	0	0	0	---	3	---	4	27	17	1	0	0
Wyoming	0	0	0	---	4	---	14	25	22	0	0	0
Colorado	2	5	9	45	8	8	69	30	22	1	3	0
New Mexico	3	2	2	1	---	---	12	7	15	0	1	0
Arizona	0	0	1	28	43	30	14	18	25	0	0	0
Utah [2]	1	0	0	---	3	1	41	50	50	1	3	0
Nevada	0	1	0	---	---	---	2	15	1	0	4	0
PACIFIC												
Washington	2	7	4	1	---	---	137	183	133	4	2	1
Oregon	1	2	2	1	4	4	53	48	48	0	4	0
California	27	16	11	12	36	36	1,371	362	362	22	16	3
Total	159	143	143	592	695	407	6,034	10,765	6,619	180	245	36
26 weeks	5,555	6,126	6,580	335,523	77,581	149,475	576,549	509,829	450,664	11,841	12,011	1,211

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended July 1, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943		July 1, 1944	July 3, 1943	
NEW ENGLAND												
Maine	0	0	0	5	14	7	0	0	0	1	2	1
New Hampshire	1	0	0	0	2	1	0	0	0	0	0	0
Vermont	0	0	0	3	3	3	0	0	0	0	0	0
Massachusetts	0	0	0	153	169	124	0	0	0	5	1	2
Rhode Island	0	0	0	1	5	5	0	0	0	1	1	0
Connecticut	0	0	0	23	22	42	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	25	4	3	176	148	154	0	0	0	3	8	8
New Jersey	2	1	0	60	26	58	0	0	0	1	1	3
Pennsylvania	6	0	0	113	63	85	0	0	0	4	11	10
EAST NORTH CENTRAL												
Ohio	6	0	1	95	66	82	0	0	0	2	4	8
Indiana	0	0	0	[illegible]	9	21	0	3	0	1	4	3
Illinois	2	0	2	59	48	93	0	1	3	3	1	6
Michigan [2]	0	1	1	64	50	104	0	0	0	4	7	3
Wisconsin	2	0	0	68	82	60	0	0	1	1	0	0
WEST NORTH CENTRAL												
Minnesota	5	1	1	38	9	22	0	0	0	0	1	1
Iowa	0	0	0	17	4	13	0	0	0	1	2	2
Missouri	1	1	0	12	10	20	0	0	1	2	2	5
North Dakota	0	0	0	8	0	2	3	0	0	0	0	0
South Dakota	0	0	0	8	6	4	0	0	1	0	0	0
Nebraska	0	0	0	9	3	4	0	1	1	0	0	0
Kansas	1	3	0	17	17	18	0	1	0	3	3	3
SOUTH ATLANTIC												
Delaware	0	0	0	1	1	3	0	0	0	0	2	1
Maryland [2]	2	0	0	24	20	12	0	0	0	1	1	1
District of Columbia	0	0	0	17	7	3	0	0	0	0	0	0
Virginia	6	0	1	16	13	10	0	0	0	3	7	5
West Virginia	1	0	0	21	6	12	0	0	0	0	6	3
North Carolina	84	1	1	12	2	11	0	0	0	0	6	6
South Carolina	2	0	2	2	0	2	0	0	0	5	3	6
Georgia	2	1	1	7	1	7	0	0	0	9	5	16
Florida	6	0	0	4	4	2	0	0	0	4	0	2
EAST SOUTH CENTRAL												
Kentucky	29	0	0	10	9	19	0	0	0	5	8	9
Tennessee	1	0	1	8	9	18	0	0	0	2	6	11
Alabama	1	0	1	5	4	7	0	1	0	1	4	4
Mississippi [2]	3	0	1	7	3	2	0	0	0	2	6	7
WEST SOUTH CENTRAL												
Arkansas	4	3	1	3	1	2	0	0	0	7	7	10
Louisiana	4	1	1	4	6	5	0	0	0	2	6	15
Oklahoma	2	23	1	3	4	9	0	0	0	2	1	3
Texas	5	80	4	34	28	18	0	0	1	21	17	17
MOUNTAIN												
Montana	0	0	0	17	6	6	0	1	0	1	0	0
Idaho	0	0	0	4	1	2	0	0	0	1	0	1
Wyoming	0	0	0	3	17	6	0	0	0	0	0	0
Colorado	1	5	1	23	42	15	0	0	0	3	0	0
New Mexico	0	0	1	2	3	3	0	0	0	2	1	4
Arizona	0	3	1	8	18	4	0	0	0	0	0	1
Utah [2]	0	2	1	19	17	5	0	0	0	0	1	0
Nevada	0	0	0	0	11	0	0	0	0	0	1	0
PACIFIC												
Washington	0	3	0	45	23	10	0	0	0	1	1	1
Oregon	5	0	0	28	4	4	1	0	0	1	0	1
California	13	57	16	202	110	75	0	0	0	6	3	4
Total	222	190	79	1,473	1,126	1,277	4	8	30	111	141	195
26 weeks	1,044	1,084	776	141,393	92,168	92,168	267	576	1,111	2,115	1,807	2,498

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended July 1, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended— July 1, 1944	Whooping cough: Week ended— July 3, 1943	Whooping cough: Median 1939–43	Week ended July 1, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	11	19	21	0	0	0	0	0	0	0	0	0
New Hampshire	0	5	0	0	0	0	0	0	0	0	0	0
Vermont	20	0	23	0	0	0	0	0	0	0	0	0
Massachusetts	52	76	144	0	0	0	0	0	0	0	0	0
Rhode Island	10	46	18	0	0	0	0	0	0	0	0	0
Connecticut	33	23	47	0	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	142	319	319	1	2	10	0	0	0	0	0	1
New Jersey	70	204	204	0	1	0	0	0	0	1	0	0
Pennsylvania	66	287	307	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	227	252	252	0	0	0	0	0	0	0	0	0
Indiana	30	55	38	0	0	0	0	0	0	0	0	0
Illinois	62	165	165	0	0	6	0	3	0	2	0	0
Michigan [2]	66	179	197	0	1	2	0	2	0	0	0	0
Wisconsin	71	288	171	0	0	0	0	2	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	9	74	35	0	3	0	0	0	0	0	1	0
Iowa	12	62	35	0	0	0	0	0	0	1	0	0
Missouri	29	42	42	0	0	0	1	0	0	1	2	0
North Dakota	5	6	7	0	0	0	0	0	0	0	0	0
South Dakota	0	7	7	0	0	0	0	0	0	0	0	0
Nebraska	13	7	7	0	0	0	0	0	0	0	0	0
Kansas	52	83	54	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	4	4	0	0	0	0	0	0	0	0	0
Maryland [2]	83	163	79	0	0	0	2	0	0	6	0	0
District of Columbia	3	36	22	0	0	0	0	0	0	0	0	0
Virginia	50	67	67	0	0	0	413	0	0	4	0	0
West Virginia	14	67	57	0	0	0	0	0	0	2	0	0
North Carolina	190	275	253	0	0	0	0	0	0	4	0	3
South Carolina	123	50	46	0	0	6	0	0	0	0	0	3
Georgia	18	17	17	0	9	9	0	0	0	1	0	26
Florida	33	38	7	0	16	1	0	0	0	0	0	11
EAST SOUTH CENTRAL												
Kentucky	93	69	61	0	0	18	0	0	0	0	0	0
Tennessee	25	58	71	0	0	0	6	0	0	0	0	0
Alabama	30	58	31	0	0	0	0	0	0	0	2	19
Mississippi [2]				0	0	0	0	0	0	0	0	5
WEST SOUTH CENTRAL												
Arkansas	23	28	19	0	2	57	0	0	0	0	4	0
Louisiana	0	10	10	0	2	16	0	0	0	0	0	1
Oklahoma	7	16	16	0	0	0	0	0	0	0	0	0
Texas	254	410	274	0	37	687	0	0	0	0	6	49
MOUNTAIN												
Montana	8	18	13	0	0	0	0	0	0	0	0	0
Idaho	4	4	6	0	0	0	0	0	0	1	0	0
Wyoming	2	4	5	0	0	0	0	0	0	1	2	0
Colorado	31	21	24	0	0	0	0	0	0	0	0	0
New Mexico	2	0	18	0	0	2	0	0	0	0	0	0
Arizona	12	19	23	0	0	0	52	1	0	0	0	0
Utah [2]	63	108	70	0	0	0	0	0	0	1	2	0
Nevada	0	6	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	19	50	61	0	0	0	0	0	0	0	0	0
Oregon	9	48	25	0	0	0	0	0	0	1	0	0
California	93	203	203	0	5	9	0	2	0	0	1	0
Total	2,170	4,046	3,749	1	79	823	474	10	0	26	20	118
26 weeks	47,504	106,015	101,777	23	755	8,856	2,967	284	15	170	300	1,413
26 weeks, 1943			-	35	961	6,344	1,726	288	14	184	478	1,286

[1] New York City only [2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts 3, New York 2, Ohio 1, Michigan 1, Virginia 1, Georgia 3, Tennessee 1, Arkansas 3, Idaho 1, California 1

WEEKLY REPORTS FROM CITIES

City reports for week ended June 17, 1944

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	0	0	6	0	1	0
New Hampshire												
Concord	0	0		0	1	0	0	0	0	0	0	0
Massachusetts												
Boston	0	0		0	90	6	6	0	61	0	1	8
Fall River	0	0		0	11	0	0	0	0	0	0	1
Springfield	0	0		0	13	1	0	0	15	0	0	7
Worcester	0	0		0	4	0	6	0	15	0	1	4
Rhode Island												
Providence	0	0		0	10	0	0	0	4	0	0	13
Connecticut												
Bridgeport	0	0		0	0	1	0	0	1	0	0	0
Hartford	0	0		0	7	0	1	0	12	0	0	1
New Haven	0	0		0	16	0	3	0	1	0	0	2
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	7	2	2	1	5	0	0	0
New York	7	1	3	0	369	15	40	0	143	0	1	29
Rochester	0	0		0	113	0	2	1	3	0	0	2
Syracuse	0	0		0	2	1	0	0	1	0	0	13
New Jersey												
Camden	0	0		0	2	0	2	0	1	0	0	0
Newark	0	0		0	81	7	3	0	13	0	0	3
Trenton	0	0		0	0	1	4	0	3	0	0	6
Pennsylvania												
Philadelphia	3	0	1	0	36	9	14	0	64	0	1	3
Pittsburgh	0	0		0	1	4	5	0	19	0	0	6
Reading	0	0		0	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		0	9	4	2	1	19	0	0	7
Cleveland	0	0	1	1	4	3	0	0	33	0	1	3
Columbus	0	0		0	3	0	5	0	3	0	0	24
Indiana												
Fort Wayne	0	0		0	0	0	3	0	0	0	0	0
Indianapolis	0	0		0	19	3	1	0	14	0	0	8
South Bend	0	0		0	0	0	0	0	0	0	0	5
Terre Haute	0	0		0	2	0	0	0	1	0	0	0
Illinois												
Chicago	2	0		0	83	9	18	2	59	0	0	20
Springfield	0	0		0	2	1	1	0	1	0	0	0
Michigan												
Detroit	7	0		1	122	3	6	0	64	0	0	17
Flint	0	0		0	4	0	3	0	4	0	0	2
Grand Rapids	0	0		0	0	0	0	0	4	0	0	1
Wisconsin												
Kenosha	0	0		0	77	0	0	0	0	0	0	6
Milwaukee	0	0		0	141	2	5	0	19	0	0	28
Racine	0	0		0	123	0	0	0	1	0	0	7
Superior	0	0		0	2	1	0	0	4	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	1	0		0	71	0	1	0	8	0	0	0
Minneapolis	2	0		0	33	2	2	1	21	0	0	7
St Paul	0	0		0	19	1	3	0	2	0	0	2

See footnotes at end of table

City reports for week ended June 17, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri:												
Kansas City	0	0		0	13	2	2	0	4	0	1	1
St. Joseph	0	0		0	0	0	0	0	1	0	0	0
St. Louis	1	0	1	0	8	5	6	0	9	0	0	14
North Dakota:												
Fargo	0	0		0	1	0	0	0	3	0	0	0
Nebraska:												
Omaha	0	0		0	6	0	2	0	4	0	0	0
Kansas:												
Topeka	0	0		0	22	0	0	0	1	0	0	2
Wichita	0	0		0	3	0	3	1	1	0	1	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	1	0	1	0	0	0	0	0
Maryland:												
Baltimore	2	0	1	0	38	4	9	0	37	0	0	55
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	1	0	149	1	7	0	24	0	0	2
Virginia:												
Lynchburg	0	0		0	0	0	0	2	1	0	0	1
Richmond	0	0		0	9	0	2	0	1	0	1	0
Roanoke	0	0		0	1	0	0	0	0	0	0	11
West Virginia:												
Charleston	0	0		0	0	0	0	0	2	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	22	0	0	0	1	0	0	9
Wilmington	0	0		0	2	0	0	0	0	0	0	5
Winston-Salem	0	0		0	3	0	0	0	1	0	0	0
South Carolina:												
Charleston	0	0		0	1	0	0	0	0	0	0	0
Georgia:												
Atlanta	0	0	1	0	1	0	2	0	2	0	0	0
Brunswick	0	0		0	0	0	0	0	2	0	0	0
Savannah	0	0		0	0	0	2	0	0	0	0	0
Florida:												
Tampa	0	0	3	0	0	2	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	9	2	1	1	0	0	1	5
Nashville	0	0		0	12	1	4	0	2	0	0	1
Alabama:												
Birmingham	0	0	1	0	2	0	1	1	0	0	0	4
Mobile	0	0		0	0	1	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Louisiana:												
New Orleans	2	0	3	1	3	2	1	5	1	0	0	0
Shreveport	0	0		0	4	0	4	0	1	0	2	1
Texas:												
Dallas	3	0		0	16	0	1	0	1	0	0	6
Galveston	0	0		0	0	0	1	1	0	0	0	0
Houston	2	0		0	1	0	5	0	2	0	0	0
San Antonio	1	0		0	0	0	5	0	1	0	0	0
MOUNTAIN												
Montana:												
Billings	1	0		0	0	0	0	0	0	0	0	0
Great Falls	0	0		0	1	0	2	0	2	0	0	0
Helena	0	0		0	3	0	0	0	1	0	0	0
Missoula	0	0		0	10	0	1	0	0	0	0	0
Idaho:												
Boise	0	0		0	0	1	0	0	0	0	0	0

See footnotes at end of table.

City reports for week ended June 17, 1944—Continued

	Diphtheria cases	Encephalitis, infectious cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
MOUNTAIN—continued												
Colorado												
Denver	1	0	1	0	15	1	4	0	3	0	0	5
Pueblo	0	0		0	0	0	0	0	3	0	0	3
Utah												
Salt Lake City	1	0		1	30	0	1	0	16	0	0	7
PACIFIC												
Washington												
Seattle	0	0		0	47	1	5	0	12	0	0	2
Spokane	0	0		0	14	1	0	0	8	0	0	0
Tacoma	0	0		0	0	1	1	0	9	0	0	2
California												
Los Angeles	13	0	4	0	245	4	4	2	29	0	0	6
Sacramento	0	0		0	42	0	2	0	15	0	1	3
San Francisco	0	0	1	0	197	3	2	1	27	0	1	4
Total	49	1	22	4	2 409	108	221	20	851	0	14	381
Corresponding week, 1943	48		40	10	5 145		305		712	0	13	1,224
Average, 1939-43	61		38	[1] 13	[2] 3 775		[1] 251		789	3	25	1,184

[1] 3 year average
[2] 5 year median

Dysentery, amebic Cases New York, 3 Cleveland, 1, Dallas, 1 San Francisco 1
Dysentery, bacillary—Cases New York, 1, Detroit, 4, Richmond, 1, Charleston, S C, 53, Houston, 5, Los Angeles, 4
Dysentery, unspecified—Cases Baltimore, 1, Shreveport, 7, San Antonio, 22
Leprosy—Cases New York 1
Rocky Mountain spotted fever—Cases Winston Salem, 4
Tularemia—Cases Chicago, 1
Typhus fever—Cases Winston Salem, 1, Birmingham, 1, New Orleans, 4, Houston, 1, San Antonio, 3

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,292,500)

	Diphtheria case rates	Encephalitis infectious case rates	Influenza		Measles case rates	Meningitis meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0 0	0 0	0 0	0 0	399	21 0	42 0	0 0	302	0 0	7 9	95
Middle Atlantic	4 6	0 5	1 9	0 0	283	18 1	33 3	0 9	117	0 0	0 9	29
East North Central	5 5	0 0	0 6	1 2	350	15 8	26 8	1 8	137	0 0	0 6	75
West North Central	8 0	0 0	2 0	0 0	350	19 9	37 8	4 0	107	0 0	4 0	56
South Atlantic	3 3	0 0	9 8	0 0	371	11 4	39 2	3 3	116	0 0	1 6	136
East South Central	0 0	0 0	5 9	0 0	136	23 6	41 3	11 8	12	0 0	5 9	59
West South Central	24 2	0 0	9 1	3 0	73	6 0	51 4	18 1	18	0 0	6 0	21
Mountain	23 8	0 0	7 9	7 9	469	15 9	63 5	0 0	199	0 0	0 0	119
Pacific	20 6	0 0	7 9	0 0	862	15 8	22 1	4 7	158	0 0	3 2	27
Total	7 5	0 2	3 4	0 6	367	16 5	33 7	3 0	130	0 0	2 1	58

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found on May 31, 1944, in Honokaa, Hamakua District, Island of Hawaii, T. H., was proved positive for plague on June 7, 1944.

Puerto Rico

Notifiable diseases—4 weeks ended June 17, 1944.—During the 4 weeks ended June 17, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Mumps	3
Chickenpox	95	Ophthalmia neonatorum	2
Diphtheria	37	Puerperal fever	2
Dysentery	16	Syphilis	895
Filariasis	13	Tetanus	24
German measles	5	Tetanus, infantile	3
Gonorrhea	416	Tuberculosis (all forms)	691
Influenza	34	Typhoid fever	24
Leprosy	1	Typhus fever (endemic)	15
Lymphogranuloma inguinale	1	Weil's disease	1
Malaria	578	Whooping cough	13
Measles	25		

DEATHS DURING WEEK ENDED JUNE 24, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 24, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8 556	9 101
Average for 3 prior years	8,601	
Total deaths, first 25 weeks of year	238 969	244,474
Deaths under 1 year of age	617	707
Average for 3 prior years	573	
Deaths under 1 year of age, first 25 weeks of year	15,649	17,001
Data from industrial insurance companies		
Policies in force	66,635,780	65,572,219
Number of death claims	12,227	12,341
Death claims per 1,000 policies in force, annual rate	9 6	9 8
Death claims per 1,000 policies, first 25 weeks of year, annual rate	10 6	10 4

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 3, 1944.—During the week ended June 3, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		20		168	485	36	41	75	165	990
Diphtheria		4	1	28	2	4		6		45
Dysentery (bacillary)				7						7
Encephalitis, infectious				1						1
German measles		1		183	120	6	68	7	74	454
Influenza			1		13	1			4	19
Measles		16	1	592	755	226	67	76	52	1,785
Meningitis, meningococcus		1		2	2	1		2		8
Mumps		10		199	190	20	18	75	43	555
Poliomyelitis								1		1
Scarlet fever		13	4	71	161	41	8	51	75	424
Tuberculosis (all forms)		15	2	86	62	22		6	84	277
Typhoid and paratyphoid fever		1		9	2				1	13
Undulant fever				14	1					15
Whooping cough		38		48	41	1	5	1	14	148

SWEDEN

Notifiable diseases—April 1944.—During the month of April 1944, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	9	Paratyphoid fever	21
Diphtheria	242	Poliomyelitis	38
Carriers	133	Scarlet fever	2,702
Dysentery	41	Syphilis	80
Encephalitis, epidemic	1	Typhoid fever	2
Gonorrhea	1,532	Undulant fever	7
Hepatitis, epidemic	517	Weil's disease	12

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

India—Calcutta.—For the week ended June 10, 1944, 151 cases of cholera with 82 deaths were reported in Calcutta, India.

Plague

Bolivia—Tarija Department—Alisos.—According to information received June 19, 1944, 6 cases of plague with 2 deaths were reported in Alisos, Tarija Department, Bolivia.

Egypt.—Plague has been reported in Egypt as follows: Ismailiya—week ended June 17, 1944, 21 cases with 3 deaths including 17 cases in the southern area; Port Said—week ended June 10, 1944, 4 cases.

Indochina.—Plague has been reported in Indochina as follows: May 11–20, 1944, Annam, 2 cases; Cochinchina, 3 cases.

Madagascar.—For the period April 11–20, 1944, 6 cases of plague were reported in Madagascar.

Smallpox

Egypt.—For the week ended May 27, 1944, 428 cases of smallpox with 24 deaths were reported in Egypt.

India—Calcutta.—For the week ended June 10, 1944, 132 cases of smallpox with 122 deaths were reported in Calcutta, India.

Nigeria.—For the week ended May 27, 1944, 165 cases of smallpox with 20 deaths were reported in Nigeria.

Peru.—For the month of March 1944, 14 cases of smallpox were reported in Peru.

Turkey.—For the month of April 1944, 295 cases of smallpox were reported in Turkey.

Venezuela.—For the month of May 1944, 66 cases of smallpox were reported in Venezuela.

Typhus Fever

Irish Free State—Roscommon County—Castlerea.—Typhus fever has been reported in Castlerea, Roscommon County, Irish Free State, as follows: Week ended June 3, 1944, 1 case; week ended June 10, 1944, 1 case.

Peru.—For the month of March 1944, 70 cases of typhus fever were reported in Peru, including 24 cases reported in Cuzco Department and 22 cases in Junin Department.

Slovakia.—For the week ended May 20, 1944, 19 cases of typhus fever were reported in Slovakia.

Turkey.—For the month of April 1944, 490 cases of typhus fever were reported in Turkey, and for the month of May 1944, 391 cases were reported.

Yugoslavia.—For the period April 1–14, 1944, 815 cases of typhus fever were reported in Yugoslavia.

Yellow Fever

Gold Coast—Kintampo.—On June 1, 1944, 1 suspected case of yellow fever was reported in Kintampo, Gold Coast.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PLANNING FOR HEALTH EDUCATION IN THE WAR AND POST-WAR PERIODS—THE NATIONAL PROGRAM [1]

By E. R. Coffey, *Medical Director, United States Public Health Service*

Health education is evolving into a specialized method by means of which it is possible to advance other public health endeavors. The Public Health Service is now shaping its educational activities in that direction, through a broad, coordinated program designed to give impetus to national thought and action in this field.

Health education is not a new function; it is as old as health work itself. In fact, it would be almost impossible to render a health service of any type if it were stripped of educational substance. Through the years public health workers have come to realize that they were using education to implement their services, and that the more effective their educational work, the more quickly people sought health for themselves and supported community health measures.

Until very recent years, however, health authorities in general at local, State, and Federal levels were guilty of acknowledging the worth of health education while they neglected to use this ally for all it is worth. Few health department budgets provided funds specifically for health education. The health department that boasted a health educator was rare indeed. The Public Health Service was in the same position.

To be sure, members of the staff made talks or showed motion pictures when organizations requested them. Pamphlets were distributed haphazardly; news items appeared when the reporter came around for a story, or when the health officer had time to write one. But organized and coordinated programs with clearly defined objectives and responsibilities were extremely rare.

These early activities stemmed from the old concept that the educational function of public health agencies was to tell people what to do and then make them do it. It was the approach of the dictator: "I teach, you learn!" Today, we are recognizing that

[1] Presented at the Wartime Public Health Conference and 72nd Annual Business Meeting of the American Public Health Association, New York City, Oct. 12, 13, and 14, 1943.

people learn only when they are interested and when they realize that they have a problem. Today, the approach is democratic—"We have a problem; what can we do to solve it?"

The objectives and responsibilities in health education thus have become more clearly defined. Evidence of this progress may be seen in the recent delineation of the functions in health education by the Committee on Professional Education of this Association.[3] Here the emphasis is placed on assisting people to recognize their own individual and community health problems, to learn the scientific facts necessary to solve these problems, and then to translate their solutions into action. Materials and methods of health education, which have absorbed so much of our discussion in the past, are still important tools. But the real objective now is to give the people an opportunity, in their own communities, mutually to study their problems and mutually to solve them. This, in the language of the educator, means "to provide learning situations."

Viewed in this light, the responsibility of health education is universal. It must encompass everyone—young and old, rich and poor, all races—for each person must become intelligently aware of his own health problems and those of his community and his nation, and share in their solution.

Along with the clarification of objective, there has emerged an increasing recognition of the importance of health education as a significant part of the total public health program. States are augmenting their budget allotments for health education. In the fiscal year 1943, $1,200,000, from all sources, was budgeted by the States for health education. In the fiscal year 1942, the amount budgeted was around $900,000.

The most significant and far-reaching evidence of the new trend in health education is the awakening interest of local health authorities, for it is at the community level that the needs of the people are met. Already local health officers are planning to have full-time health educators on their permanent staffs. In fact, it has now become apparent that every full-time health unit, as defined by the Committee on Local Health Units, of this Association should have at least one qualified full-time health educator.

While these changes have been going on, the Public Health Service has coordinated the various health education activities carried on by several of our divisions. It has long been the policy of the Public Health Service to stimulate and support leadership in community and State. In health education the function of the national agency, therefore, becomes one of assisting the State and local groups in applying the problem-solving process.

[3] Proposed report on the educational qualifications of health educators. Am. J. Pub. Health, 33: 996–1003 (August 1943).

A primary responsibility of the Federal agency is to lead the way in defining national problems, in focusing the Nation's attention upon them, and in attacking those problems. More than a quarter of a century ago, the Federal government used the facts of maternal and infant mortality as opening guns in the drive to secure health services for mothers and children. Today maternal and child health services are Nation-wide. Very little could be done toward eliminating the venereal diseases so long as the prejudice against talking of these diseases prevailed and kept the people from hearing or speaking of this national health problem. The Federal government broke the long silence on this subject in 1936. Since then, the whole Nation has become vocal against the venereal diseases. More important still, the Nation has increased by 300 percent the clinics where these diseases are diagnosed and treated. In many other fields the Federal government has led the way by telling the facts and by supporting the attack.

An equally mandatory responsibility of the national agency is to give consultation and practical assistance to State and local health departments in the planning and conduct of effective health education programs. To this end, the Public Health Service has recruited eight qualified health educators and has broadened their experience by putting them to work in a few local health departments. Here they become regular members of the staff, and, under the supervision of the health officer, they organize and operate a community health education program.

These programs have not dealt with new problems in public health or raised controversial issues. In every case the program has been focused upon old problems of public health, the solution of which is a part of our enormous wartime responsibility. Venereal disease and prostitution, tuberculosis, food sanitation, rat control—even garbage disposal—are all problems with which health officers are struggling. But their solution depends upon community participation. And our health education programs have been the community's meeting-ground for understanding and action against these menaces to health and welfare.

In one community, the health officer had been blocked for years from obtaining hospital facilities for the long waiting list of tuberculosis patients in the county. The barrier was the resistance of uninformed citizens who feared that the proximity of a tuberculosis hospital would expose them to a dangerous disease. When all of the people joined in the community health education program and learned how tuberculosis is spread, how it is prevented, and how it is treated, they rose up and demanded the release of an idle building for a county tuberculosis hospital.

In another community, restaurant owners had been apathetic to the idea of food sanitation and the training of food handlers. When the subject of sanitation was studied in the community health education program, the need for improvement was recognized by the citizens. Within the month of study devoted to sanitation, the restaurant owners in a body were begging the health department to provide instruction for their employees.

And in yet another town, a once casual interest in typhus and its presence in a nearby State grew into a community demand for rat control. Many of the housewives who joined in the program had never associated typhus with rats, nor were they aware of the heavy infestation of rodents, not only in the dumps and alleys, but in the market areas of their own town.

These typical accomplishments are evidence that the programs developed by our health educators are effective. Even more significant is the acceptance of this type of program by health officials in the States where our staff has been in action. North Carolina has employed five health educators to take over the programs initiated by Public Health Service workers and has placed five others in training to increase the number of local health departments having this new type of program. Complete information on other States is not available, but we do know that Oklahoma, Illinois, Indiana, California, and South Carolina are training one or more health educators.

As our staff of health educators has grown and has been through the test of doing the job themselves, the Public Health Service is building a foundation for further expansion of public health education in the States through the provision of consultant services at the District level.

An emergency resource for community health education has been utilized in our malaria control program. For the past two summers, local school teachers have been employed in the malarious areas of the South to carry on educational programs. The teachers were given an intensive 2-week course on malaria control and on methods of community health education. They then returned to work as regular employees of their county health departments for the remainder of the vacation period. Although this has been an emergency program, it has had values beyond the immediate results. The teachers have become more interested in community health problems and their solution. They have carried their new-found knowledge and enthusiasm into the classroom, the faculty meeting, and the community after their summer jobs as malaria educators were over. And the program has convinced many health officers of the value of a full-time health educator on their staffs.

The Public Health Service should be able to assist State and local health departments in the preparation of educational materials which

they propose to issue. Although health education materials prepared by national organizations, both official and nonofficial, have been used widely by local health departments, many communities would prefer to prepare their own materials.

The preparation of effective materials, however, requires special skills which many State and local health departments cannot afford. By using consultant services, health departments can improve the quality of local materials. The Public Health Service cannot yet give as much assistance of this type as it would like to give. We do have a staff of specialists in the production of health education materials—pamphlets, popular talks, press releases, posters, film strips, movies, radio plays, and exhibits. Within the limits of staff, we shall be glad to consult with State and local health departments on the preparation of their materials.

The Service has a further duty—to hold high the standards of training for health educators, and in doing so to make sure that they are well grounded in the fundamental principles of preventive medicine and public health, and that they understand the learning process. The first requirement is to make them missionaries for scientific medicine, and the second is to make them competent guides to learning rather than didactic instructors. Our initial efforts have been materially aided by two grants from the W. K. Kellogg Foundation for fellowships in health education. These grants were made to meet the growing need for trained personnel in war areas and to stimulate schools of public health to include more training in community organization for health education.

Thirty-six students are in training at the University of North Carolina, University of Michigan, and Yale University, on Fellowships established by Kellogg grants, for their master's degree in public health with a major in public health education. Another group of about the same number are taking similar training on stipends paid by State health departments. Health educators of the Public Health Service are available to the schools to describe the programs the Service has developed.

After 9 months of academic training the students are required to take 3 months of field training. This field experience is acquired in those health departments where our educators are operating demonstration programs.

In the future, participation of the Public Health Service in the training of health educators will be concentrated on recruiting trainees, cooperating with the schools of public health, and on promoting health education as a profession among vocational training and guidance groups.

The Public Health Service is also well equipped to act as a clearing house for health information, methods, and materials. The fact-

finding resources available to the Service in the fields of medicine, hygiene, and other interrelated sciences are not likely to be duplicated at the State or local level. Both professional and lay groups have constant need for reference to authoritative source materials. A few years ago, the machinery was set up to provide service of this type. Reference materials useful in public health education, especially pamphlets and reprinted publications, were collected. Current literature was covered systematically. Thus, a pool of source materials on many special topics of interest to professional and nonprofessional groups was established. Later, a special collection of pamphlets for lay consumption was made, including the materials issued by 115 official and nonofficial health agencies. A start was made on establishing a catalog of motion picture films.

In order to make some of these references more readily available, the Service proposes to make up loan packets containing pamphlet materials from a variety of agencies. The packets will be devoted to health problems of national importance in wartime. The purpose of these packets is to help health departments in selecting pamphlet materials or in developing their own publications. If the circulation of the first group of loan packets is sufficient to warrant it, it may be possible to expand the service.

Pooling source information is only one of the many functions the Public Health Service can profitably perform as a clearing house, but present resources limit its performance. For example, more bibliographies should be compiled, especially in relation to public health work during the war and to post-war health problems. A select catalog of motion-picture films, which have been reviewed for accuracy and effectiveness, together with a brief comment on each film would be enormously useful. Analysis of the news—that is, classification and appraisal of news stories and editorial comment on health matters—is a service which should be available to health authorities in order that they may be informed on trends in public interest.

In connection with these information services, the national agency has a further important function, namely, that of reviewing and abstracting the current literature of scientific research and public health administration. It is a truism that the ever-growing body of knowledge in the health fields is beyond the powers of any individual to encompass, hence the need for consistent and concerted effort to summarize the significant contributions as they appear. The Public Health Service has met this responsibility only in a limited area, that is, venereal disease control and public health engineering. Venereal Disease Information and Public Health Engineering Abstracts have won a permanent place in the current reference literature. But there are still enormous gaps left in our service of this type.

It is impossible for any one agency to produce all the materials

needed in public health education. Obviously, the national agency should confine its efforts in this field to problems of national importance and to new problems not yet fully recognized. It is particularly important that we continue to strive for materials of high quality, since in making health education materials available the Public Health Service should present accurate information and demonstrate modern approaches and techniques. That our production has been small is due both to limited appropriations and to the universal war problem of maintaining sufficient personnel. However, the materials produced by the Public Health Service in recent years have exercised a considerable influence on the quality of health education materials. The wide circulation of our illustrated folders, posters, workers' health series, and films also has attested their value.

No health agency can escape the responsibility of answering personal inquiries from the general public. Of the thousands of letters directed to the Public Health Service, a large proportion could perhaps be answered better by a State or local organization. This is especially true when the writer has some personal or family health problem about which he desires authoritative information or practical help. We have often debated whether we should redirect such inquiries to the State health officer. But, since the Service is a governmental agency from which the public has a right to expect an answer, we must continue to reply to these requests. The Service has, however, adopted the policy of referring correspondence of certain classifications directly to the State health department. These include complaints about State or local health conditions, requests for birth certificates and for information on State or local vital statistics. However, we believe that people should learn more and more to turn to their State health authorities. Better public information regarding the services and organization of the official agency at the State level would greatly advance public awareness.

Perhaps the most essential function of a national agency, particularly at the present stage of development, is research and evaluation. Results must be measured in order to ascertain the degree to which the many procedures now in use do change knowledge, attitude, and behavior. The various media and the ways in which they are used must also be evaluated, and we must know how to make the most effective use of radio, posters, exhibits, pamphlets, and motion pictures. Data as to which types of material are most useful among groups at different economic and educational levels are also needed. A small beginning on some of these problems has been made through: (1) a study of the individual instruction given by public health nurses and sanitarians, (2) an evaluation study of exhibits at the New York World's Fair, and (3) an unpublished study on the readability of health education pamphlets.

Further studies have been discontinued, but the Service expects to resume these activities after the war.

In summary, the objective of health education during the war and in the post-war period is to stimulate and assist individuals to recognize, study, and solve their own health problems, both individual and community. The particular responsibilities of the Public Health Service may be defined as:

(1) To focus attention on health problems of national scope as they arise.

(2) To give consultation service and assistance in program planning and execution, and in the preparation of materials when such assistance is requested.

(3) To stimulate the training of personnel and hold high the standards for their training and accomplishment.

(4) To serve as a clearing house for new ideas, methods, and materials.

(5) To summarize new developments in science and show its applicability to the subject matter of health education.

(6) To prepare high quality materials that have national application.

(7) To conduct an information service for the many inquiries received.

(8) To conduct research on methods and materials of health education, and evaluate programs with the purpose of making all our efforts more effective.

Mutual action by Federal, State, and local agencies is necessary in the operation of a national health education program. It is hoped that the discussions here today will facilitate all our efforts to educate the people so that they will know what steps to take to maintain health and will be willing to take them.

PLANNING FOR HEALTH EDUCATION IN THE WAR AND POST-WAR PERIODS—THE SCHOOL PROGRAM [1]

By JOHN W. STUDEBAKER, *United States Commissioner of Education*

The topic, "National Planning for Health Education in the War and Post-war Periods," is a very formidable assignment even when it is limited to a discussion of the part to be played by the organized educational system of the Nation in making and effectuating such plans.

In a democracy planning is both desirable and inevitable. Man is an animal endowed with foresight and the ability to look ahead, to project future goals. Individual and social planning can no more be avoided than can eating or breathing. Planning in a democracy is largely educational in character, both in the projection of goals and in the choice of means for achieving them; democracy must depend upon an engineering of human consent based on understanding. In a democratic society the role of government, both in making and effectuating plans, is to discover, to represent, and to implement the will of the people.

[1] Address delivered at the Wartime Public Health Conference of the American Public Health Association, New York City, Oct. 12, 1943.

Now let us turn to the particular topic of health education. The ultimate health goal of the school is to help each student to attain the best possible physical development and condition for his particular age and biological endowment. Be it noted at once that the public health service, the home, the family doctor, and others share this objective with the school. The primary concern of the school as an educational agency is with the development by the individual student of good health knowledge functioning through good health habits. The attainment of optimum individual health depends upon a nexus of factors or influences, many of which do not appear to be primarily educational in character. It depends, for example, upon the income of parents, upon the home dietary standards, upon community provisions for sanitation, medical care, and recreation. It depends upon all of these factors as well as upon community provisions for the health education of students in schools. All of these factors are involved in a complete consideration of the means by which the ideal of positive health for each individual in the Nation may be attained.

The special responsibility of the schools is not only to help to develop personal ideals of health but also to give students a proper knowledge of the means, both individual and social, by which those ideals may be attained. Or, to put the matter otherwise, the development of a personal health consciousness and of a social conscience regarding the health of others is a primary educational goal. The school effort to assist the student in the development of personal health consciousness and of a social conscience regarding the health of others ordinarily goes by the name of health instruction. It is designed to communicate a knowledge of sound principles of hygiene, both physical and mental, a knowledge of how to deal with emergencies, of when to utilize the services of health experts, of the possibilities of preventive medicine, of how to combat the spread of disease, and of the principles of good nutrition. The controlling objective of all such health instruction is not merely knowledge or understanding as such, but knowledge which can be made to function in daily living, knowledge which is put into practice and made a part of the habit system of the individual.

How far short we, as a Nation, are of attaining the goal of positive physical and mental health for all citizens is a matter into which I have neither the time nor the ability to go in any exhaustive way. Suffice it to say that this war has disclosed again, as did the First World War, the alarming discrepancies which exist between health goals and individual health status. Of the first 2,000,000 young men examined for the Army, 50 percent failed to pass the physical examinations. Perhaps two-thirds of the disqualifying physical defects could have been prevented if taken in time. It is obvious, of course, that the schools

of the Nation must bear their fair share of blame for this condition since an effective program for the identification of remediable physical defects in school children and youth has not been universally operative during the past 25 years.

Following the First World War some 34 States passed laws making physical education mandatory in the schools. Many of these laws were more honored in the breach than in their effective observance. Nevertheless, some States and school systems did inaugurate fairly efficient systems of physical education. With respect to the medical examination of school children, however, the record is not so good. Only 1 State, New York, has by law a State director of medical inspection; in perhaps 5 other States some official in the State department of education or of health serves in this capacity. Examinations are required annually in 19 States; every 2 years in 2 States; every 3 years in 1. In a large majority of the States, however, no medical examination is required by law or by regulation, and it is frequently true that in those States in which such an examination is required it is limited and cursory in character.

Many of the larger cities of the Nation, it must be noted, do provide a rather thorough medical examination of students as they enter and again before they graduate from high school. But even in these larger cities, enrolling about half of the Nation's youth of high school age, much more thorough and universal examination of students is in order. This has been brought home to the United States Office of Education with especial force in the past year in connection with the efforts made to stimulate and guide the development of physical fitness programs in the high schools.

In the summer of 1942 it became apparent that, in view of the national emergency, there was need for a readjustment of the secondary school curriculum. To meet this need, the Office of Education, with the assistance of a committee of prominent educators, promulgated the High School Victory Corps as a wartime pattern of student organization and curricular readjustment. Participation in a physical fitness program was made a prominent feature of the Corps. This was in recognition of the fact that one of the most important things the schools could do for young people was to give them a better physical preparation for the exigencies of wartime. More strenuous physical activity, harder muscular work, toughening of physical fibre, physical stamina to endure—these cannot be attained unless there are sustained and vigorous physical activity programs.

Under the auspices of the Office of Education and with the cooperation of the Committee on Physical Fitness of the Federal Security Agency, a committee of representatives of the armed forces and of health and physical educators was brought together and made responsible for evolving a program of physical fitness to serve as a guide

for the schools of the Nation. Their recommendations are embodied in detail in two publications: Physical Fitness Through Physical Education for the High School Victory Corps and Physical Fitness Through Health Education for the High School Victory Corps.

Without going into detail as to the recommendations contained in those two bulletins, it may suffice to say that physical fitness is meant to connote good nutrition, muscular strength, endurance, motor skills, mental health, and morale. Physical conditioning of boys is to be achieved in the school program by combative sports, by games stressing individual competition, by games that develop team play and the team spirit of "all for one and one for all." It was recognized that it is not enough to herd youths together and exercise them vigorously. A constructive physical-fitness program must include the rationale of the activities so that youth may learn how to conduct themselves in a physical regimen and through hygienic living under varying circumstances. Health instruction was therefore given a prominent place in the recommended physical-fitness program. The achievement of physical fitness takes time, and another major recommendation for the schools' program for physical fitness in wartime was for an increase from the usual two or three periods a week to one period daily for physical and health education, plus 2 hours daily of extracurricular physical activity.

With the purpose of implementing the High School Victory Corps program for the preinduction training of high school students for war service, legislation has been introduced in the Senate which, if passed, would authorize appropriations to assist the States to make available rather thorough medical examinations for at least one-third of the students enrolled in secondary schools, and to provide local district teacher-training services for teachers of physical fitness in the high schools. This legislation has the active backing of the American Association of Health, Physical Education, and Recreation, of the armed forces, and of the National Education Association. For if there is one thing concerning which educators are in substantial agreement at the present time it is that the preliminary physical conditioning of high school youth for the rigors of military life and for the strain of wartime living is a job which the high schools must and can be expected to accomplish.

It is recognized, of course, that there have been a few critics of this program, just as there have always been critics of any effort to modify the time-honored high school curriculum—even in wartime. Because the Nazis put great stress upon the physical conditioning of German youth, some people argue that any such effort on our part would be a step toward Nazification. It is somewhat as if one were to argue that we should all become atheists because Hitler calls on God to vindicate Nazi programs. Obviously, physical hardihood

can be made to serve the ends of evil tyrants or it can be made to contribute to the overthrow of these same tyrants. If we must choose between the development of a knowledge of Shakespeare and the development by youth of strong and vigorous bodies, Shakespeare will have to wait in wartime. Of course, even in wartime one is not confronted with the necessity for any such choice. Many high schools are doing both—continuing to provide opportunity for the liberal humanizing studies and at the same time putting greater emphasis upon health and physical education for high school youth.

The second part of my assigned topic, namely, planning for health education in the post-war period, is more difficult than the first. Not only does post-war planning for health education look to a more distant and to some degree unpredictable future, but the subject is further complicated by the fact that, as far as can be ascertained, no representative educational body has yet made any definite and detailed pronouncement on post-war health education in the schools. Consequently, if I am to discuss the matter at all, I must ask you to pardon me for my seeming personal presumption in proposing—rather dogmatically perhaps—some planks in a platform of health education for the post-war period.

First, there is need for a more adequate and properly graded program of health instruction in every school in the land. There is particular need for greater stress on this subject matter in the high schools, where students have sufficient maturity to understand the physiologic and scientific background information for healthful living.

The second plank in a platform for post-war health education has to do with the physical accommodations of the school. Every child and youth in America ought to go to a school which is well built, comfortable, sanitary, properly lighted, and provided with sufficient gymnasium and playground facilities to permit a well-rounded program of physical activities, games, sports, etc.

Third, there should be school provisions for the annual medical examination of school children and youth, with a follow-up to acquaint parents with the results of the school examination; and to encourage, and if necessary assist in securing, such reparative or remedial work as may be indicated. I realize that in this matter of health and medical service as distinguished from health instruction there are differing viewpoints and opinions. Personally, I have been of the opinion for many years that it is not only a legitimate province but a duty of the schools to provide for medical examinations of students and for proper follow-up of these examinations. I do not believe that it is the province of the schools to provide dental and medical services of a reparative and remedial character. That is the proper function of the public health services, the medical and dental professions, and

most particularly of the parents of the children themselves. There should be proper coordination of the health services of the schools with those of other community agencies to the end that the needs of the children and youth are definitely met. If we keep our eyes on the same goal, we should find ourselves marching side by side in the provision of adequate health services for all of America's children and youth.

A fourth plank in my platform for post-war health education in and through the schools concerns education for the physically handicapped. At first thought this may seem to be somewhat outside the field of health education. Yet, if health education is concerned with mental as well as physical well-being, it is important that essential justice be done to the physically handicapped by providing them with opportunities for a completely rounded-out program of developmental activities, suited to their individual capacities and needs. In this program of developmental activities, the physical development of handicapped children has an important place. There are tens of thousands of these children in America—the lame, the deaf, the semisighted, the undernourished—who should be enabled to get to school and to be given a well-balanced program of instruction, rest, exercise, and nutrition which will help them in so far as possible to overcome or to compensate for their handicaps. Beginnings have already been made in a number of the States in assisting local communities to meet the additional cost of transportation or of educational and health services for the handicapped out of State tax resources. I believe that it is a proper function of the Federal government to stimulate the extension of such pioneer efforts in other States until every handicapped child in the Nation is assured of equity with respect to educational opportunity.

Fifth, I propose as a plank in the platform of post-war health education that the schools undertake to provide opportunities for older children and youth to experience for at least a month out of each year the health-building activities of a well-conducted camp. This again is not exclusively a health-education proposal, although its major benefit would be the building of health and physical vigor. As things stand now the opportunity to experience the benefits of summer camping is limited largely to children from homes of comfortable economic circumstances, and to a very limited extent to children from economically underprivileged homes. I believe that it is a proper project of publicly-supported education to provide these opportunities for all children.

Sixth, and finally, I would propose as an essential part of a program of post-war health education in the schools that provision be made for a balanced noonday meal for every school child in America. I shall not enter upon a discussion of ways and means of implementing that

proposal. We have had a great deal of experience in the past 20 years with school-lunch programs, supported in part in recent years by surplus commodities or by Federal funds.

In connection with the provision of school lunches, as with all of the other planks in this proposed platform for post-war health education, it is apparent that the crucial questions have to do with the means by which such more or less ideal measures may be made actual and real. In the last analysis all of these things have an economic tag attached to them—they will cost money, and the question of means becomes finally a question of how much money they will cost and how this money is to be provided. Sufficient to say, it is my opinion that the provision of the funds necessary to implement any such program of improved health services and activities as I have outlined is a joint responsibility of the local communities, of the States, and finally, of the Nation. We have learned in this war that the results of malnutrition, of physical handicap and underdevelopment are not a concern solely of the localities, or even of the States. The children and youth reared in one locality or one State become youthful or adult citizens of other localities and other States. In time of national peril when our national resources of manpower as well as matériel must be mobilized we become acutely conscious of the national interest in measures of health and education. It is to be hoped that this national interest will be matched by a national sense of responsibility and by appropriate national action.

I believe firmly in the necessity of safeguarding the rights of self-determination, of freedom of choice and of decision, which are the very essence of democratic government—whether in the individual, the small group of neighbors, the community, the State, or the Nation. I believe, in other words, in the necessity for decentralization of the controls of education in our communities, keeping these controls of education close to the parents of the children and youth to be educated. On the other hand, the units for the administration and the support of education must not be so small and weak that a minimum defensible program of education cannot be provided for the children and youth concerned.

Furthermore we have in the principle of grants-in-aid a workable compromise between decentralized support, administration, and control and some measure of coordination and regulation by the larger and wider community of State and Nation, which are also parties-at-interest to the education and development of their citizen-rulers. In other words, the question of Federal and State aid to education is a primary consideration in any realistic discussion of the possibilities of national planning for health education in the post-war period. When we have determined as a Nation to remove the glaring dis-

crepancies and inequalities in educational opportunity in America we shall then find it relatively easy to plan for the removal of these same discrepancies in that part of the educational program which is concerned with the optimum development of the health of all American youth.

PLAGUE INFECTION REPORTED IN THE UNITED STATES DURING 1943[1]

IN HUMAN BEINGS

One case of plague in a human being and one death from the disease were reported in the United States during the calendar year 1943, both of which occurred in Siskiyou County, Calif.

The fatal case is of especial interest in that the death occurred 2 months after the onset of the disease. The case was in a child between 2 and 3 years of age, who was taken ill on November 8 or 9, 1942,[2] and terminated fatally on January 10, 1943.[3] The patient was erroneously reported to have recovered.[4] According to information furnished by Dr. Wilton L. Halverson, Director of Public Health in California, the diagnosis established at autopsy was "bubonic plague and chronic plague encephalitis."

A case of plague was reported in the same county during the week of August 28, 1943, occurring in a boy 11 years of age residing on an Indian reservation in Quartz Valley. The infection was believed to have been contracted on a hunting trip near Fort Jones

Two fatal cases of plague were reported in Siskiyou County in 1941, both in children. One case was in a 10-year-old boy living near Montague and one in a 5-year-old boy living 1 mile northeast of Mount Shasta City, about 50 miles from the locality in which the other case occurred. Subsequently, plague infection has been found in ground squirrels and fleas from ground squirrels taken in scattered localities in the county.

A suspected case of plague was reported in Harney County, Ore., during the year, occurring in a sheepherder 60 years of age. According to Dr. H. M. Graning, of the Public Health Service, who investigated the case on June 17, a bubo appeared in the left groin of the patient about May 12. The patient had been working in a

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[1] A consolidation of reports received from the Plague Laboratory of the U. S. Public Health Service in San Francisco, Calif., and published currently in the Public Health Reports. Previous reports on plague infection in the United States are as follows.

Plague in the United States (1900–1939). Pub. Health Rep., 55: 1143–1158 (June 28, 1940).

Plague infection reported in the United States during 1940. Pub. Health Rep., 56: 399–400 (Feb. 28, 1941).

Plague infection reported in the United States during 1941. Pub. Health Rep., 57: 903–905 (June 12, 1942).

Plague infection reported in the United States during 1942. Pub. Health Rep., 58: 640–646 (Apr. 16, 1943).

[2] Public Health Reports, 57: 1879–1880 (Dec. 4, 1942).

[3] Public Health Reports, 58: 850 (May 28, 1943).

[4] Public Health Reports, 58: 640 (Apr. 16, 1943).

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locality in which plague infection had previously been found. On the basis of physical examination, clinical history, and possible exposure in an infected area, Dr. Graning was of the opinion that it was a case of plague. While the laboratory examination and tests of material secured from the bubo did not reveal *B. pestis*, the infection had been in process for more than 30 days before the examination. In view of the fact that the diagnosis was not confirmed bacteriologically, and the case was not reported as plague by Dr. Stricker, State health officer of Oregon, it has not been so recorded by the Public Health Service.

IN RODENTS AND ECTOPARASITES

As in previous years, field surveys to determine the location and extent of endemic areas were conducted by mobile units operated by the Public Health Service and by several western States. The Public Health Service plague laboratory in San Francisco continued to examine the animal tissues and ectoparasites collected by these field units and to aid in identifying the species of animals and infected insects. During 1943, plague infection was proved in rats (*Rattus* sp.) in Oakland, Calif., and Tacoma, Wash., and in wild rodents or ectoparasites in California, Colorado, Montana, New Mexico, Oregon, and Wyoming. During the year plague infection was reported for the first time in the following named localities: *California*—Inyo and Kings Counties; *Colorado*—Huerfano, Larimer, and Las Animas Counties; *Montana*—Custer County; *New Mexico*—Lincoln, Quay, Sandoval, Torrance, and Union Counties; *Wyoming*—Carbon and Johnson Counties. Infection was found during the year in the following-named animals and parasites: *Rodents*—rats (*Rattus* sp.), ground squirrels, chipmunks, wood rats, meadow mice, harvest mice, white-footed mice, grasshopper mice, and prairie dogs; *ectoparasites*—fleas, lice, and ticks.

The proved area of plague infection in wild rodents was extended farther east during the year by the finding of infected fleas from grasshopper mice (*Onychomys leucogaster*) taken 12 miles south of Clayton, Union County, N. Mex. This is slightly east of any area in which sylvatic plague had previously been reported, that is, Quay County, N. Mex., in 1943; in Divide County, N. Dak., in 1941; and Larimer County, Colo., in 1943. The accompanying table lists the areas and the species of rodent or ectoparasite in which plague infection was found and reported to the Public Health Service in 1943.

It should not be inferred that these and previous reports give the complete picture or delineation of the actual area in which plague infection has been or is present among wild rodents in the western States, nor a quantitive measure of infection, as the forces engaged in the field surveys, the areas covered each year, and the seasonal

periods favorable for conducting the surveys are limited. Although necessarily restricted more or less to a sampling procedure, the surveys demonstrate the continuance of a wide biological and geographic distribution of plague infection in western United States and will serve to give a warning if the areas of sylvatic infection approach localities of sufficient biological densities of susceptible rodent species and human populations to constitute a dangerous situation.

The presence of plague infection in specimens of animal tissues and ectoparasites was demonstrated in each instance by laboratory examination, inoculation of laboratory animals, or mass inoculation with emulsions of parasites.

Plague infection in rats, wild rodents, and their ectoparasites reported to the Public Health Service during 1943

State and county	Date [1]	Infection found in—
California		
Alameda County	Mar 10	Spleen from a rat (*Rattus norvegicus*) taken in Oakland
Do	Mar 17	A pool of organs from 5 rats (*R norvegicus*) taken in Oakland
Contra Costa County	Mar 12	Organs from 18 Norway rats taken in Richmond
Eldorado County	Aug 27	5 pools of fleas from 8 ground squirrels (*C beecheyi*), 6 golden mantled ground squirrels, and 22 chipmunks taken from locations near Lake Tahoe
Do	Sept 1	Tissue from 1 ground squirrel (*C beecheyi*) taken at Tallac, Lake Tahoe
Do	Sept 20	Pools of fleas from 23 golden mantled ground squirrels and 2 Tamarack squirrels (*Sciurus douglasii albolimbatus*) taken at Tallac
Inyo County	Sept 22	Pool of fleas from 38 ground squirrels (*C beldingi*) taken at South Lake Resort, 14 miles west of Big Pine
Kern County	June 28	Pool of 2 collections of fleas from 12 ground squirrels (*C beecheyi*) taken approximately 3 mil northwest of Tehachapi
Do	June 9	Pools of fleas and lice from 48 ground squirrels (*C beecheyi*) taken 6 miles north of California Institution for Women
Do	June 12	Pool of fleas from 7 ground squirrels (*C beecheyi*) taken 1 mile west of Cummings Valley School
Do	June 15	Pool of fleas from 6 ground squirrels (*C beecheyi*) taken 7 miles northwest of Tehachapi
Do	Nov 8	Pool of fleas from 22 ground squirrels (*C beecheyi*) taken 2 miles northwest of Lebec
Kings County	June 25	Pool of fleas from 10 ground squirrels (*C beecheyi*) taken approximately 7 miles southeast of Hanford
Mono County	June 12	Pool of fleas from 18 golden mantled ground squirrels
Do	July 14	Pool of fleas from 18 ground squirrels (*C beldingi*)
Do	July 19	Pool of tissue from 9 chipmunks
Do	July 31	2 pools of fleas from 64 (2 lots) golden mantled ground squirrels
Do	Aug 12	Pool of fleas from 21 chipmunks All specimens collected at or within 5 miles east and 4 miles south of June Lake
Monterey County—(Camp Hunter Ligget Military Reservation, Jolon)	Mar 30	Tissue from 1 wood rat and from 2 pools of wood rats (*Neotoma fuscipes*), tissue from 1 and pools of fleas from 55 meadow mice (*Microtus californicus*)
Do	Mar 30-31	Pool of fleas from 76 wood rats (*N fuscipes*) and a pool of fleas from 32 harvest mice (*Reithrodontomys* sp)
Do	Mar 31	2 pools of fleas, respectively, from 87 and 108 meadow mice (*M californicus*), a pool of fleas from 3 species of mice (*Peromyscus* sp)
San Antonio River	Aug 3-4	Pool of fleas from 46 wood rats (*Neotoma* sp)
Fort Ord Military Reservation (12 miles southwest of Salinas)	Mar 15	Pool of fleas from 3 ground squirrels (*C beecheyi*)
Do	Mar 18	Pool of fleas from 16 meadow mice (*M californicus*)
Do	Mar 19	Pool of fleas from 31 mice (*Microtus* sp) (27) and (*Peromyscus* sp) (4)

[1] In most instances the date on which the specimens were collected

Plague infection in rats, wild rodents, and their ectoparasites reported to the Public Health Service during 1943—Continued

State and county	Date	Infection found in—
California—Continued.		
Monterey County—Continued		
Fort Ord Military Reservation (12 miles southwest of Salinas)	Mar 20	Pool of fleas from 24 mice, (*Microtus* sp) (22) and (*Peromyscus* sp) (2)
Do	Mar 23	Pool of fleas from 9 meadow mice (*Microtus* sp)
Do	Mar 24	Pool of fleas from 40 and a pool of organs from 10 meadow mice (*Microtus* sp)
Do	Mar 26	Pool of fleas from 47 and a pool of organs from 10 meadow mice (*Microtus* sp)
Do	Mar 27	Pool of fleas from 46 mice (*Microtus* sp)
Do	Mar 29	Pool of fleas from 47 mice (*Microtus* sp)
In areas designated—		
Area C 2	Apr 9	Organs from 20 meadow mice (*Microtus* sp)
Do	Apr 10	Organs from 10 meadow mice (*Microtus* sp)
Area D	Apr 9	Pool of fleas from 23 mice (*Peromyscus* sp)
Do	Apr 14	Pool of fleas from 19 mice (*Peromyscus* sp)
Do	Apr 19	Organs from 9 mice (*Peromyscus* sp)
Do	Apr 22	Pool of fleas from 2 ground squirrels (*C beecheyi*)
Area E	Apr 13	Organs from 44 mice (*Microtus* sp)
Do	Apr 18-19	Organs from 19 mice (*Microtus* sp) and 2 ground squirrels (*C beecheyi*)
Do	Apr 19	Organs from 36 mice (*Microtus* sp)
Do	Apr 20	Organs from 2 ground squirrels (*C beecheyi*)
Location 12 miles south and 12 miles east of Monterey	July 9	Tissue from 1 ground squirrel (*C beecheyi*) and 5 pools of fleas from 33 ground squirrels, same species
Do	July 12	Pool of tissue from 10 ground squirrels (*C beecheyi*) and 5 pools of fleas from 27 ground squirrels, same species
Location 12 miles south and 18 miles east of Monterey	July 22	Pool of tissue from 9 ground squirrels (*C beecheyi*), a pool of fleas from 19, and a pool of ticks from 19 ground squirrels, same species
Do	July 31	Pool of fleas from 19 ground squirrels (*C beecheyi*)
Location 10 miles south and 14 miles east of Monterey	July 1	6 pools of fleas, each from 35 ground squirrels (*C beecheyi*) and 1 pool of ticks from 39 ground squirrels, same species
Do	July 2	Pool of fleas and a pool of ticks, each from 29 ground squirrels (*C beecheyi*)
Do	July 13	4 pools of fleas each from 16 ground squirrels (*C beecheyi*)
Do	July 15	Pool of fleas from 16 ground squirrels (*C beecheyi*)
Location 13 miles south and 20 miles east of Monterey	July 14	Pool of tissue from 10 ground squirrels (*C beecheyi*) and a pool of fleas from 33 ground squirrels, same species
Do	July 19	Pool of ticks from 33 and a pool of ticks from 12 ground squirrels (*C beecheyi*)
Location 11 miles south and 12 miles east of Monterey	July 20	Pool of fleas from 14 ground squirrels (*C beecheyi*)
Location 11 miles east of Bradley	Aug 5	Pool of tissue from 6 ground squirrels (*C beecheyi*)
Location 9 miles south and 3 miles west of King City	Aug 20	2 pools of fleas, each from 16 ground squirrels (*C beecheyi*)
Nevada County	July 5	Pool of fleas from 18 ground squirrels (*C beecheyi*)
Placer County	Sept 24	Pool of fleas from 1 ground squirrel (*C beecheyi*) taken at Carnelian Bay, Lake Tahoe
San Diego County	Mar 15	Pool of fleas from 27 ground squirrels (*C fisheri*) taken 1½ miles southwest of Bonsell
Do	Mar 18	Pool of fleas from 52 ground squirrels (*C beecheyi*) taken 1½ miles southeast of Delmar
Do	Aug 27	Pools of fleas from ground squirrels (*C fisheri*) as follows 15 ground squirrels taken at Lake Henshaw, 20 ground squirrels taken at Cuyamaca State Park, 20 ground squirrels taken 31 miles south of Julian 44 ground squirrels taken approximately 3 miles southeast of Julian
Santa Clara County	Aug 31	2 pools of fleas from lots, respectively, of 7 and 5 ground squirrels (*C beecheyi*) taken near military reservation
Siskiyou County	July 13	Pool of fleas from 14 ground squirrels (*C douglasii*) taken approximately 8 miles northeast of Etna
Do	Sept 27	Pool of fleas from 5 ground squirrels (*C douglasii*) taken 4 miles northwest of Yreka a pool of fleas from 4 ground squirrels, same species, taken approximately 6 miles northeast of Montague
Stanislaus County	May 17	Pool of fleas from 4 ground squirrels (*C beecheyi*) (proved May 17) taken 4 miles east of Crows Landing

Plague infection in rats, wild rodents, and their ectoparasites reported to the Public Health Service during 1943—Continued

State and county	Date	Infection found in—
Colorado:		
Huerfano County	Aug. 16	Pool of fleas from 97 prairie dogs (*Cynomys gunnisoni*) taken 15 miles northwest of Walsenburg, Highway No. 69.
Larimer County	June 21	Pool of fleas from 38 black-tailed prairie dogs (*Cynomys ludovicianus*) taken 5 miles northwest of Wellington.
Las Animas County	July 23	Pool of fleas and ticks from 127 prairie dogs (*C. ludovicianus*) taken 30 miles northwest of Springfield.
Montana:		
Custer County	Sept. 3	Pool of fleas from 28 prairie dogs (*C. ludovicianus*) taken 20 miles southeast of Miles City.
Do	Sept. 4	Pool of fleas from 30 prairie dogs (*C. ludovicianus*) taken 27 miles southeast of Miles City.
Do	Sept. 13	Pool of fleas from 41 prairie dogs (*C. ludovicianus*) taken 18 miles southeast of Miles City.
Do	Sept. 22	Pool of fleas from 20 prairie dogs (*C. ludovicianus*) taken 21 miles south of Miles City.
Garfield County	Apr. 4	Pool of fleas from 80 prairie dogs (*C. ludovicianus*) taken 12 miles west of Jordan.
Do	Apr. 5	Pool of fleas from 83 prairie dogs (*C. ludovicianus*) taken 12 miles west of Jordan.
Do	Aug. 9	Pool of fleas from 18 prairie dogs (*C. ludovicianus*) taken 7 miles west of Jordan.
Do	Aug. 10	Pool of fleas from 82 prairie dogs (*C. ludovicianus*) taken 35 miles south of Jordan.
Do	Aug. 11	Pool of fleas from 89 prairie dogs (*C. ludovicianus*) taken 18 miles west of Jordan.
New Mexico:		
Lincoln County	Apr. 22	Pool of fleas from 9 prairie dogs (*C. ludovicianus*) taken 1½ miles south of Corona.
Do	Apr. 27	Pool of fleas from 3 grasshopper mice (*Onychomys torridus*) taken 8 miles south of Carrizozo.
Quay County	May 22 [2]	Pool of fleas from 23 grasshopper mice (*Onychomys leucogaster*) taken 19 miles east of Tucumcari.
Do	May 24 [2]	Tissue from 1 grasshopper mouse (*O. lecuogaster*) taken 19 miles east of Tucumcari; 2 pools of fleas from lots of 18 and 23 wood rats (*Neotoma albigula*) taken, respectively, 15 and 20 miles east of Tucumcari.
Sandoval County	May 24 [2]	Pool of fleas from 30 grasshopper mice (*Onychomys* sp.) taken 2 miles west of Bernalillo.
Torrence County	May 8	Pool of fleas from 2 thirteen-striped ground squirrels (*Citellus tridecemlineatus*) taken 2 miles south of Moriarty.
Union County	June 1	Pool of fleas from 11 grasshopper mice (*O. leucogaster*) taken 9 miles south of Clayton.
Do	June 11	Pool of fleas from 9 grasshopper mice (*O. leucogaster*) taken 12 miles south of Clayton.
Oregon:		
Grant County	June 20	Tissue from 1 ground squirrel (*C. oregonus*) taken south of Seneca on Highway No. 70.
Do	June 24	Pool of fleas and lice from 63 ground squirrels (*C. oregonus*) taken 6 miles east of Long Creek.
Malheur County	June 22	Pool of fleas from 21 ground squirrels (*C. oregonus*) taken 6 to 11 miles west of Jordan Valley.
Union County	June 5	Pool of 187 fleas and 15 lice from 93 ground squirrels (*C. oregonus*) taken 1 to 5 miles west of North Powder.
Washington:		
Pierce County, Tacoma	Jan. 2 to May 4	15 pools of tissue and 24 pools of fleas from rats (*R. norvegicus*) taken in industrial, commercial, and residential sections of the city of Tacoma.
Wyoming:		
Carbon County	July 21	Pool of fleas from 35 ground squirrels (*C. richardsoni*) taken 20 miles north of Rawlins.
Johnson County	Sept. 21	Pool of fleas from 50 prairie dogs (*C. ludovicianus*) taken 17 miles south of Arvada and a pool of fleas from 25 prairie dogs (same sp.) taken 12 miles south of Arvada.
Do	Sept. 22	Pool of fleas from 75 prairie dogs (*C. ludovicianus*) taken 13 miles south of Arvada.

[2] Date infection proved.

PUBLIC HEALTH SERVICE ACT, 1944

The Public Health Service Act, signed by President Roosevelt on July 3, 1944, is another milestone in the 146-year history of the United States Public Health Service.

The act brings together in compact and orderly arrangement substantially all existing law affecting the Service. It eliminates many outmoded regulations and, in a series of revisions dictated by operating experience, streamlines the administration of the Public Health Service.

In several respects the act broadens the scope of previously established Public Health Service functions. It provides authority to make grants-in-aid to research institutions for study of any disease—in the same way the National Cancer Act of 1937 provides for cancer research. It authorizes expansion of the Federal-State cooperative public health programs, and calls for the establishment of a national tuberculosis control program, patterned after the venereal disease control program.

The final act presented to the President for approval is the result of two years' work and study under the leadership of Representative Alfred L. Bulwinkle, of North Carolina. It is due to the interest and close attention of Mr. Bulwinkle, Senator Elbert Thomas, of Utah, and their colleagues that this essential streamlining of the Nation's public health law has been brought to a successful conclusion.

The new law retains all the important duties which Congress has laid upon the Service in previous legislation enacted over the last half century. Basic responsibilities still include medical and hospital care of American Merchant Marine seamen, the United States Coast Guard, and other Federal beneficiaries; the National Quarantine Service; scientific research; control of biologic products; and care of lepers and narcotic drug addicts. Assistance to State and Territorial health departments also will continue.

In recent years, the trend of public health work has been toward tackling public health problems individually and directing all available resources to the eradication of widely prevalent diseases which place an unnecessary burden upon the health and economy of the Nation. The new law, which authorizes establishment of a tuberculosis control program, makes it possible to extend this type of direct attack. The program follows the pattern of the national venereal disease control program, authorized by the Congress in 1938. It places upon the Public Health Service the responsibility of administering grants-in-aid to State health departments, and of conducting demonstrations and research leading toward the eradication of tuberculosis.

The Act also raises the ceiling of Federal appropriations for grants-in-aid to the States for general public health services from $11,000,000

annually (as provided under title VI of the Social Security Act) to $20,000,000. It empowers the Service to use a limited portion of these funds for the training of public health personnel and for special demonstrations in the solution of particular community health problems.

Provision also is made for the strengthening of the commissioned corps of the United States Public Health Service and for the commissioning of specialists in scientific fields relating to public health—such as entomology, chemistry, and zoology. Under the new law, nurses may now be commissioned in the Service. Other sections of the act carry over previous legislation giving the commissioned personnel of the Public Health Service in wartime substantially the same benefits and privileges afforded officers of the Army and Navy.

Fundamental reorganization laws expanding Public Health Service functions and strengthening its administration have been enacted through the years. Acts of Congress in 1878, 1890, 1893, and 1906 authorized the Service to prevent the introduction of epidemic diseases into this country from abroad and to prevent the interstate spread of communicable diseases. In 1889, the Service was organized along military lines and provision made for the establishment of a corps of commissioned officers with grades, ranks, and rates of pay similar to those of the Army and Navy Medical Corps.

The organization of the Service now includes four major administrative units—the Office of the Surgeon General, the National Institute of Health, the Bureau of State Services, and the Bureau of Medical Services. The staff of the Surgeon General is made up of a Deputy Surgeon General and three Assistant Surgeons General in charge of the three bureaus. In addition, staff officers with the rank of Assistant Surgeon General are assigned to the administration of dental and sanitary engineering activities. The Medical Director of the United States Coast Guard has the rank of Assistant Surgeon General on the staff of the Surgeon General of the Public Health Service.

The significance of the Public Health Service Act is far reaching. From a legislative point of view, the codification of laws of a Service which came into being in 1798 is of direct benefit, not only to the Service itself, but to the various governmental and State agencies that have to deal with public health. It might well serve as model legislation for all Federal services and bureaus.

TUBERCULOSIS CONTROL DIVISION ESTABLISHED IN BUREAU OF STATE SERVICES, UNITED STATES PUBLIC HEALTH SERVICE

Moving quickly to put into effect the provisions of the Public Health Service Act (PL 410, 78th Congress) for the control of tuberculosis, Surgeon General Thomas Parran, on July 6, 1944, established

a Tuberculosis Control Division in the Bureau of State Services of the United States Public Health Service. Federal Security Administrator Paul V. McNutt on the same day approved the organization of the new division.

Establishment of this administrative unit is the first step leading to the implementation of the Federal-State cooperative program for tuberculosis control authorized in Section 314, subsection *b*, of the Public Health Service Act. The subsection was introduced in the Senate as an amendment by Senator Elbert Thomas of Utah, after the passage of the act in the House; the House concurred without a dissenting vote.

Grants and services to States authorized in this subsection include the provisions embodied in a tuberculosis control bill backed by the National Tuberculosis Association and sponsored in the House by Mr. Alfred Bulwinkle and in the Senate by Mr. Thomas. When it became apparent that passage of the Public Health Service Act would precede passage of the bill, the sponsors of the legislation moved to incorporate the same tuberculosis control provisions in the Public Health Service Act. Subsection *b* reads

> To enable the Surgeon General to carry out the purposes of section 301 with respect to developing more effective measures for the prevention, treatment, and control of tuberculosis, and to assist, through grants and as otherwise provided in this section, States, counties, health districts, and other political subdivisions of the States in establishing and maintaining adequate measures for the prevention, treatment, and control of such disease, including the provision of appropriate facilities for care and treatment and including the training of personnel for State and local health work, and to enable him to prevent and control the spread of tuberculosis in interstate traffic, and to meet the cost of pay, allowances, and traveling expenses of commissioned officers and other personnel of the Service detailed to assist in carrying out the purposes of this section with respect to tuberculosis, and to administer this section with respect to such disease, there is hereby authorized to be appropriated for the fiscal year ending June 30, 1945, the sum of $10,000,000, and for each fiscal year thereafter a sum sufficient to carry out the purposes of this subsection

Senior Surgeon Herman E. Hilleboe, who has been in charge of the Public Health Service emergency tuberculosis control program since 1942, has been appointed chief of the new Division, with the rank of Medical Director The first activity undertaken by the Tuberculosis Control Division, according to Dr. Hilleboe, is the preparation of a budget for submission to Congress at an early date in order to obtain the funds authorized for the Nation-wide program.

The Surgeon General's order establishing the Division follows

FEDERAL SECURITY AGENCY

U. S. PUBLIC HEALTH SERVICE

Washington 14

WASHINGTON, *July 6, 1944.*

Public Health Service Reorganization Order No. 2.
Subject: Organization of Tuberculosis Control Division.

Pursuant to the authority contained in section 202 of the Public Health Service Act, Public Law 410, 78th Congress, approved July 3, 1944, the following order is promulgated:

There is hereby established within the Bureau of State Services the Tuberculosis Control Division. This Division will perform all functions authorized by section 314 (*b*) of the Public Health Service Act to be performed with respect to (1) developing more effective measures for the prevention, treatment, and control of tuberculosis, (2) assisting States, counties, health districts, and other political subdivisions of the States in establishing and maintaining adequate measures for the prevention, treatment and control of such disease, and (3) preventing and controlling the spread of tuberculosis in interstate traffic, and any other activities with respect to the prevention, treatment, and control of tuberculosis, which may be authorized to be performed by the Public Health Service.

The administrative functions of the Division with respect to the tuberculosis prevention and control program will be comparable to those of the Venereal Disease Division with respect to the venereal disease program and subject to the provisions of Reorganization Order No. 1, dated December 30, 1943.

Approved:

PAUL V. MCNUTT,
Administrator.

THOMAS PARRAN,
Surgeon General.

JULY 6, 1944.

FELLOWSHIPS IN HEALTH EDUCATION FOR MEN

The United States Public Health Service, through the cooperation of the National Foundation for Infantile Paralysis and the W. K. Kellogg Foundation, has announced that fellowships in health education are now available for qualified men of certain Selective Service classifications. The fellowships have been made available for the fall term of college, 1944. The requirements for men are the same as those previously announced for women (Public Health Reports, May 26, 1944) with the exception that the men must be 30 years of age and over or must have a Selective Service classification of 4 F or 1 AL. The qualifications are: A bachelor of science degree from a recognized college, skill in the use of the English language, courses in the physical, biological, and social sciences, education, and educational psychology, plus the ability to work effectively with people. The awards will lead to a master of science degree in public health. Training will consist of

9 months of academic work in public health education and 3 months of supervised field experience; $100 a month will be paid for all 12 months, plus full tuition and travel.

Application forms may be obtained from the Surgeon General, United States Public Health Service, Washington 14, D. C. Applications must be in the office of the Surgeon General not later than August 15, 1944, accompanied by a transcript of college credits and a small photograph.

DEATHS DURING WEEK ENDED JULY 1, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 1, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8 473	9 428
Average for 3 prior years	8,353	
Total deaths first 26 weeks of year	247,443	253,902
Deaths under 1 year of age	599	680
Average for 3 prior years	560	
Deaths under 1 year of age, first 26 weeks of year	16,252	17 681
Data from industrial insurance companies		
Policies in force	66,643 086	65,581 183
Number of death claims	11 441	12 017
Death claims per 1,000 policies in force, annual rate	9 0	9 6
Death claims per 1,000 policies, first 26 weeks of year, annual rate	10 5	10 3

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 8, 1944

Summary

With the exception of the Pacific area, increased incidence of poliomyelitis was reported in all of the 9 geographic sections of the country. The largest numerical increases occurred in the South Atlantic, Middle Atlantic, and East North Central areas. A total of 290 cases was reported for the country as a whole, as compared with 222 last week, 84 for a 5-year (1939–43) median, and 245 for the corresponding week last year. The next largest number for a corresponding week in the past 6 years was 86, reported in 1941. Of the current total, 196 cases, or 68 percent, occurred in 5 States, as follows (last week's figures in parentheses): North Carolina 94 (84), New York 34 (25), Kentucky 28 (29), Pennsylvania 26 (6), Virginia 14 (6). A total of 1,295 cases has been reported to date this year, as compared with 1,329 for the same period last year and a 5-year median of 847. The unusually high incidence at this time last year was confined chiefly to the Pacific and West South Central areas, while this year the largest numbers of cases are being reported in the South Altantic, East South Central, and Middle Atlantic States.

A total of 188 cases of meningococcus meningitis was reported, as compared with 180 last week, 267 for the same week last year, and a 5-year median of 32. The current increase, noted in the Middle Atlantic, South Atlantic, East South Central and Pacific Areas, is mostly accounted for by the increase in Pennsylvania from 6 to 21, and California, from 22 to 32 cases, respectively. New York reported 18 cases, New Jersey 11, and Maryland 12. The total to date is 12,029, as compared with 12,278 last year and a 5-year median of 1,241.

Of a total of 138 cases of typhoid fever, as compared with 111 last week and a 5-year median of 215, Texas reported 24, Georgia 11, South Carolina 9, Louisiana 8, and Ohio, Kentucky, and Tennessee 7 each. The cumulative figure to date is 2,253, as compared with 1,953 for the same period last year and a 5-year median of 2,730.

A total of 33 cases of Rocky Mountain Spotted Fever was reported, of which 23 occurred in the South Atlantic and East South Central areas; 6 in the Mountain section.

Deaths recorded in 93 large cities of the United States aggregated 7,835, as compared with 8,476 last week and a 3-year average of 7,919. The cumulative total is 255,281, as compared with 261,803 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended July 8, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943	
New England:												
Maine	0	0	0	------	------	------	32	23	38	1	4	0
New Hampshire	0	0	0	------		------	31	11	9	0	3	0
Vermont	0	0	0	------	------	------	10	91	74	0	0	0
Massachusetts	2	0	0	------	------	------	347	480	480	5	19	2
Rhode Island	1	0	0	6	------	------	13	106	53	0	0	0
Connecticut	0	1	1	------	------	------	66	124	145	1	7	1
Middle Atlantic:												
New York	2	14	10	[1] 1	[1] 1	[1] 1	328	1,292	738	18	28	4
New Jersey	1	1	1	------	2	1	262	967	285	11	9	0
Pennsylvania	5	7	7	------	------	------	133	226	226	21	18	4
East North Central:												
Ohio	6	3	3	3	2	5	68	216	62	0	9	1
Indiana	4	2	2	1	1	2	14	108	22	2	3	0
Illinois	4	10	10	13	5	4	72	548	150	8	14	1
Michigan [2]	3	3	1	1	2	------	296	883	230	8	5	1
Wisconsin	2	2	0	2	7	8	461	942	643	5	2	0
West North Central:												
Minnesota	3	4	2	------	------	1	72	131	31	1	1	0
Iowa	3	1	1	------	1	1	16	52	69	1	2	0
Missouri	4	1	1	------	1	------	19	58	38	8	9	0
North Dakota	0	2	0	1	1	1	7	96	12	1	1	1
South Dakota	2	1	2	------	------	------	3	159	10	0	1	0
Nebraska	2	3	1	------	------	------	23	55	16	1	2	0
Kansas	3	4	3	------	4	2	51	67	60	2	0	1
South Atlantic:												
Delaware	0	1	0	------	------	------	3	5	4	1	1	0
Maryland [2]	4	0	3	3	3	2	59	85	31	12	7	5
District of Columbia	0	0	1	1	------	------	28	39	39	2	5	0
Virginia	0	3	3	37	32	25	82	102	102	6	15	1
West Virginia	3	3	3	1	------	1	53	8	8	1	4	0
North Carolina	4	2	3	------	19	1	99	41	41	1	13	1
South Carolina	2	1	4	100	160	111	31	38	38	4	9	1
Georgia	2	2	3	5	8	5	35	8	15	1	5	1
Florida	3	2	1	5	9	3	34	18	13	[3] 1	5	1
East South Central:												
Kentucky	1	1	1	4	2	1	28	12	12	3	5	2
Tennessee	7	1	3	16	6	11	25	18	27	5	2	2
Alabama	4	2	2	15	12	4	9	30	30	5	1	1
Mississippi [2]	7	6	6	------	------	------	0	------	------	2	2	1
West South Central:												
Arkansas	1	2	2	11	12	6	24	16	16	0	2	0
Louisiana	0	6	4	------	11	9	19	15	1'	2	0	1
Oklahoma	0	3	3	1	5	5	31	4	12	4	4	0
Texas	23	16	14	236	295	122	277	118	118	7	7	2
Mountain:												
Montana	1	0	1	------	1	------	8	69	44	1	2	0
Idaho	0	0	0	4	3	------	17	3	7	0	0	0
Wyoming	0	0	0	------	9	------	9	12	14	0	0	0
Colorado	5	5	5	------	11	11	20	32	32	1	0	0
New Mexico	2	0	0	------	------	------	4	1	10	0	1	0
Arizona	3	1	1	22	30	27	19	20	20	1	3	0
Utah [2]	0	0	0	------	------	------	30	70	70	0	2	0
Nevada	0	0	0	1	------	------	42	2	2	0	0	0
Pacific:												
Washington	1	10	3	------	------	------	121	93	93	1	5	0
Oregon	3	2	2	1	------	1	27	46	46	1	7	0
California	15	10	16	12	13	17	841	366	366	32	23	2
Total	138	138	138	503	669	438	4,299	7,906	4,763	188	267	32
27 weeks	5,693	6,264	6,700	336,026	78,250	149,771	560,848	517,735	338,261	[3] 12,029	12,278	1,241

[1] New York City only.

[2] All current reports in this table for Michigan, Maryland, Mississippi, and Utah are for a period ended earlier than Saturday.

[3] Corrected report for Florida, week ended Apr. 15, meningococcus meningitis, 2.

Telegraphic morbidity reports from State health officers for the week ended July 8, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[4]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943		July 8, 1944	July 10, 1943	
New England:												
Maine	0	0	0	14	2	3	0	0	0	1	1	1
New Hampshire	0	0	0	6	2	1	0	0	0	0	1	0
Vermont	1	0	0	11	5	0	0	0	0	1	0	0
Massachusetts	0	0	0	74	132	65	0	0	0	3	8	5
Rhode Island	1	0	0	4	4	4	0	0	0	0	0	0
Connecticut	2	1	0	19	25	14	0	0	0	0	1	0
Middle Atlantic:												
New York	34	5	3	111	87	110	0	0	0	6	3	5
New Jersey	2	1	1	33	23	34	0	0	0	1	0	2
Pennsylvania	26	0	1	88	38	76	0	0	0	0	4	6
East North Central:												
Ohio	7	3	1	258	74	74	2	0	0	7	14	7
Indiana	6	0	0	20	12	12	0	0	1	2	2	2
Illinois	6	5	2	44	38	65	0	1	3	2	5	5
Michigan	1	0	0	80	34	67	2	0	0	1	3	3
Wisconsin	1	0	0	46	88	50	0	0	1	0	1	1
West North Central:												
Minnesota	2	2	1	44	21	21	0	0	1	0	0	0
Iowa	2	1	1	9	19	15	0	0	0	1	0	3
Missouri	1	0	0	12	24	12	0	0	0	1	1	5
North Dakota	1	1	0	5	1	4	0	0	0	1	0	0
South Dakota	0	0	0	14	4	4	0	5	4	0	0	0
Nebraska	1	0	0	5	14	7	0	0	0	0	0	0
Kansas	2	5	0	15	10	16	0	0	0	2	0	1
South Atlantic:												
Delaware	0	0	0	2	1	2	0	0	0	0	0	0
Maryland	0	0	0	37	9	11	0	0	0	4	2	2
District of Columbia	0	0	0	2	9	9	0	0	0	0	0	0
Virginia	14	1	1	18	13	10	0	0	0	1	10	10
West Virginia	0	0	0	19	16	12	1	0	0	4	8	6
North Carolina	94	0	1	11	11	11	0	0	[illegible]	8	3	4
South Carolina	4	0	0	2	2	1	0	0	0	9	2	6
Georgia	4	0	4	6	11	8	0	0	0	11	11	20
Florida	7	0	2	2	6	1	0	0	0	5	4	4
East South Central:												
Kentucky	28	2	2	6	5	8	0	0	0	7	9	11
Tennessee	2	3	2	12	6	14	0	0	0	7	8	10
Alabama	5	1	2	5	7	7	0	0	0	4	1	5
Mississippi	2	0	1	2	6	2	0	1	0	6	7	8
West South Central:												
Arkansas	1	3	0	2	1	2	0	0	0	3	5	8
Louisiana	9	0	0	5	4	4	0	0	0	8	6	12
Oklahoma	2	44	3	1	7	7	0	0	1	4	3	9
Texas	5	90	4	40	25	17	0	0	0	24	17	37
Mountain:												
Montana	0	0	0	8	3	6	1	0	0	1	0	0
Idaho	2	0	0	7	1	1	0	0	0	0	0	0
Wyoming	0	0	0	3	11	3	0	0	0	0	0	0
Colorado	8	1	0	10	25	8	0	0	0	2	0	0
New Mexico	0	0	0	0	1	1	0	0	0	0	1	2
Arizona	1	0	0	14	3	2	0	0	0	0	2	1
Utah	0	0	0	15	14	6	0	0	0	0	0	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
Pacific:												
Washington	1	0	0	65	10	10	0	0	0	0	0	1
Oregon	2	0	0	22	10	5	0	0	0	1	0	1
California	8	75	14	161	90	53	0	0	0	5	3	4
Total	290	245	84	1,389	964	921	6	7	19	138	146	215
27 weeks	[5]1,295	1,329	847	142,782	93,132	93,132	273	583	1,130	2,253	1,953	2,730

[4] Including paratyphoid fever cases reported separately, as follows: Massachusetts 2, New York 1, New Jersey 1, Georgia 2, Florida 1, Kentucky 1, Tennessee 1, Arkansas 1, Louisiana 1, Texas 5.

[5] Corrected total. Delayed report of 39 cases in North Carolina (Public Health reports June 23, 1944, p. 815) was erroneous.

Telegraphic morbidity reports from State health officers for the week ended July 8, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended July 8, 1944								
	Week ended—		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	July 8, 1944	July 10, 1943			Amebic	Bacillary	Unspecified					
New England												
Maine	11	15	22	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	1	0	0	0	0	0	0	0	0	0
Vermont	30	13	14	0	0	0	0	0	0	0	0	0
Massachusetts	48	53	84	0	0	0	0	0	0	0	0	0
Rhode Island	2	18	18	0	0	0	0	0	0	0	0	0
Connecticut	24	19	38	0	0	0	0	1	0	0	0	0
Middle Atlantic												
New York	83	247	247	0	1	6	0	1	0	1	0	0
New Jersey	47	160	160	0	0	0	0	1	0	2	0	0
Pennsylvania	76	199	238	0	0	0	0	1	0	0	0	0
East North Central												
Ohio	196	211	211	0	1	0	0	2	0	0	0	0
Indiana	20	79	62	0	0	0	0	0	0	0	0	0
Illinois	78	139	139	0	3	0	0	0	0	0	0	0
Michigan	43	190	167	0	0	0	0	1	0	0	0	0
Wisconsin	67	283	223	0	0	0	0	1	0	0	0	0
West North Central												
Minnesota	14	80	41	0	2	0	0	[illegible]	0	0	0	0
Iowa	10	58	47	0	0	0	0	[illegible]	0	1	0	0
Missouri	31	46	17	0	0	0	1	0	0	0	0	0
North Dakota	14	20	15	0	0	0	0	1	0	0	0	0
South Dakota	55	1	1	0	0	0	0	1	0	0	0	0
Nebraska	17	14	14	0	0	0	0	0	0	0	0	0
Kansas	70	83	69	0	0	0	0	0	0	0	1	0
South Atlantic												
Delaware	4	6	4	0	0	0	0	0	0	0	0	0
Maryland	91	86	84	0	0	0	2	1	0	2	0	0
District of Columbia	1	38	22	0	0	0	0	0	0	0	0	0
Virginia	55	144	112	0	0	0	286	0	0	2	1	0
West Virginia	34	74	36	0	0	0	0	0	0	1	0	0
North Carolina	144	176	123	0	0	0	0	0	0	5	0	1
South Carolina	124	144	90	0	0	64	0	0	0	1	0	1
Georgia	22	39	37	0	0	4	0	0	0	0	0	29
Florida	21	7	8	0	3	0	0	0	0	0	0	6
East South Central												
Kentucky	156	29	45	0	0	0	0	0	0	3	0	0
Tennessee	69	54	54	0	0	0	8	0	0	7	2	0
Alabama	47	39	39	0	49	0	0	0	0	2	0	18
Mississippi				0	0	0	0	0	0	0	0	3
West South Central												
Arkansas	11	46	22	0	0	36	0	0	0	1	1	0
Louisiana	1	22	12	0	4	27	0	0	0	0	1	6
Oklahoma	15	40	17	0	0	0	0	0	0	2	0	0
Texas	267	316	234	0	6	626	0	1	0	0	3	27
Mountain												
Montana	4	31	14	0	0	0	0	0	0	0	0	0
Idaho	3	2	7	0	0	0	0	0	0	0	0	0
Wyoming	8	0	3	0	0	0	0	0	0	0	6	0
Colorado	15	33	33	0	0	0	0	0	0	0	0	0
New Mexico	0	8	22	0	0	0	0	0	0	0	0	0
Arizona	17	24	8	0	0	0	48	0	0	0	0	0
Utah	62	93	55	0	0	0	0	0	0	3	0	0
Nevada	0	0	0	0	0	0	0	1	0	0	0	0
Pacific												
Washington	13	49	29	0	0	0	0	0	0	0	0	0
Oregon	5	32	26	0	0	0	0	0	0	0	0	0
California	47	216	222	0	2	13	0	0	0	0	0	1
Total	2,172	3,676	3,431	0	71	776	345	13	0	33	15	92
Same week, 1943	3,676			0	34	566	449	18	1	18	21	98
Same week, 1942	3,522			2	20	482	394	9	0	24	25	65
27 weeks, 1944	49,676			23	826	9,632	3,312	297	15	203	315	1,505
27 weeks, 1943	109,691			35	995	6,910	2,175	306	15	202	499	1,384
27 weeks, 1942	102,036		[6] 105,049	44	533	3,683	2,257	233	32	[6] 227	526	[6] 924

[6] 5-year median, 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 24, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	10	0	1	0	4	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	1	0		0	106	4	10	0	41	0	2	17
Fall River	0	0		0	13	1	2	0		0	0	6
Springfield	0	0		0	17	1		0	12	0	0	5
Worcester	0	0		0	2	0	6	0	10	0	0	14
Rhode Island												
Providence	0	0		0	4	1	2	0	3	0	0	3
Connecticut												
Bridgeport	0	0		0	1	1	0	0	1	0	1	1
Hartford	1	0		0	8	0	1	0	9	0	0	4
New Haven	0	0		0	11	0	3	0	2	0	0	2
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	4	1	4	2	4	0	0	0
New York	14	2		0	148	18	31	5	108	0	2	28
Rochester	0	0		0	68	0	3	1	6	0	1	1
Syracuse	0	0		0	1	0	0	0	1	0	0	14
New Jersey												
Camden	0	0		0	3	1	0	0	6	0	0	0
Newark	0	0		0	57	4	6	0	11	0	0	11
Trenton	0	0		0	0	0	3	0	0	0	0	1
Pennsylvania												
Philadelphia	5	0	1	1	20	5	17	0	39	0	1	2
Pittsburgh	0	0		0	4	3	5	3	10	0	0	14
Reading	1	0		0	2	0	1	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	2	0		0	9	2	1	0	15	0	0	14
Cleveland	0	0	1	1	2	4	3	1	18	0	0	14
Columbus	0	0		0	3	0	1	0	2	0	0	15
Indiana												
Fort Wayne	0	0		0	0	0	1	0	0	0	0	0
Indianapolis	0	0		1	11	1	5	0	9	0	0	8
South Bend	0	0		0	0	0	0	0	1	0	0	0
Terre Haute	0	0		0	3	0	2	0	0	0	0	0
Illinois												
Chicago	3	1		0	78	9	17	0	38	0	1	32
Michigan												
Detroit	6	0	1	2	89	6	7	0	32	0	0	43
Flint	0	0		0	0	0	1	0	1	0	0	0
Grand Rapids	0	0		0	1	0	0	0	4	0	0	0
Wisconsin												
Kenosha	0	0		0	47	0	0	0	0	0	0	10
Milwaukee	0	0		0	120	1	1	0	16	0	0	17
Racine	1	0		0	109	0	0	0	0	0	0	5
Superior	0	0		0	1	0	0	0	2	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	78	0	0	0	3	0	0	1
Minneapolis	3	0		0	12	1	4	2	16	0	0	1
St Paul	0	0		0	6	0	1	2	17	0	0	12
Missouri												
Kansas City	0	0		0	7	0	2	0	4	0	0	0
St Joseph	0	0		0	2	0	0	0	4	0	0	0
St Louis	0	0		0	2	3	6	0	5	0	1	15
North Dakota												
Fargo	0	0		0	0	0	0	0	2	0	0	0

City reports for week ended June 24, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	3	0		0	5	0	2	0	3	0	0	0
Kansas:												
Topeka	0	0		0	19	0	0	0	0	0	0	1
Wichita	0	0		0	1	0	4	0	0	0	0	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	1	0	0	0	0	0	0	0
Maryland:												
Baltimore	3	0		0	20	0	7	0	12	0	1	80
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	1	0	0	0
District of Columbia:												
Washington	0	0		0	46	3	6	0	17	0	0	1
Virginia:												
Lynchburg	0	0		0	2	0	0	1	0	0	0	1
Richmond	0	0		0	2	0	3	0	1	0	0	3
Roanoke	0	0		0	0	0	0	0	0	0	0	4
West Virginia:												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	3	0	4	0	0	0	0	2
Wilmington	0	0		0	4	0	2	0	0	0	0	16
Winston-Salem	0	0		0	0	0	2	0	0	0	0	4
South Carolina:												
Charleston	0	0		0	2	0	1	1	2	0	0	0
Georgia:												
Atlanta	0	0	2	0	0	0	1	0	3	0	2	0
Brunswick	0	0		0	0	0	0	0	1	0	0	0
Savannah	0	0		0	1	0	1	0	0	0	0	0
Florida:												
Tampa	2	0		0	2	0	3	0	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	2	2	1	0	3	0	0	18
Nashville	0	0		0	5	0	4	0	1	0	0	0
Alabama:												
Birmingham	0	0		0	0	1	2	0	0	0	0	5
Mobile	0	0		0	0	2	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	1	0	0	0	0	1
Louisiana:												
New Orleans	2	0	1	1	13	3	7	6	3	0	2	0
Texas:												
Dallas	0	0		1	16	0	1	0	0	0	0	7
Galveston	0	0		0	1	0	1	0	0	0	1	0
Houston	4	0		0	5	0	7	0	1	0	1	1
San Antonio	1	1	1	0	1	1	3	0	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0		0	1	0	0	0	1	0	0	0
Great Falls	0	0		0	0	1	2	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	0
Missoula	0	0		0	10	0	0	0	1	0	0	0
Idaho:												
Boise	0	0		0	0	0	1	0	0	0	0	0
Colorado:												
Denver	2	0		0	10	2	5	1	13	0	0	11
Pueblo	1	0		0	0	0	2	0	0	0	0	2
Utah:												
Salt Lake City	0	0		0	29	0	1	0	8	0	0	8

City reports for week ended June 24, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0		0	41	1	3	0	12	0	0	0
Spokane	1	0	1	1	12	0	0	0	5	0	0	0
Tacoma	0	0		0	11	0	2	0	13	0	0	0
California:												
Los Angeles	5	0	2	0	213	1	1	3	25	0	4	4
Sacramento	0	0		0	32	0	1	0	18	0	0	1
San Francisco	3	0	1	0	110	2	4	0	16	0	0	0
Total	64	4	11	8	1,679	81	235	29	618	0	20	482
Corresponding week, 1943	67	2	42	11	4,150	130	301	39	595	0	15	1,284
Average, 1939-43	57		32	[1] 11	[2] 3,163		[1] 257		638	2	25	1,188

[1] 3-year average, 1941-43.
[2] 5-year average, 1939-43.

Dysentery, amebic.—Cases: Philadelphia, 1; Detroit, 1; Houston, 1, Los Angeles, 1; San Francisco, 3.
Dysentery, bacillary.—Cases: Providence, 1; St. Louis, 1, Baltimore, 1, Richmond, 2, Atlanta, 1, Nashville, 1; Houston, 1; Los Angeles, 9.
Dysentery, unspecified.—Cases: Richmond, 1; Houston, 1; San Antonio, 16.
Rocky Mountain spotted fever.—Cases: Philadelphia, 1; St. Louis, 2, Baltimore, 1; Richmond, 1, Winston-Salem, 1.
Typhus fever.—Cases. New York 2; Savannah, 3; Tampa, 2, New Orleans, 2; Houston, 4, Galveston, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,209,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.3	0.0	0.0	0.0	455	21.1	66.1	0.0	217	0.0	7.9	137
Middle Atlantic	9.3	0.9	0.5	0.5	142	12.5	32.4	5.6	86	0.0	1.9	33
East North Central	7.4	0.6	1.2	2.5	290	14.1	24.0	0.6	85	0.0	0.6	97
West North Central	11.9	0.0	0.0	0.0	263	8.0	37.8	8.0	107	0.0	2.0	64
South Atlantic	8.2	0.0	3.3	0.0	136	4.9	50.7	3.3	62	0.0	4.9	181
East South Central	0.0	0.0	0.0	0.0	41	29.5	53.1	0.0	24	0.0	0.0	136
West South Central	21.1	3.0	6.0	6.0	109	12.1	60.4	18.1	15	0.0	12.1	27
Mountain	23.8	0.0	0.0	0.0	397	23.8	87.4	7.9	183	0.0	0.0	167
Pacific	14.2	0.0	6.3	1.6	663	6.3	17.4	4.7	141	0.0	6.3	8
Total	9.8	0.6	1.7	1.2	257	12.4	36.0	4.4	94	0.0	3.1	74

PLAGUE INFECTION IN CIMARRON COUNTY, OKLA.

Plague infection has been reported in ectoparasites collected on June 8, 20 miles southwest of Boise City, Cimarron County, Okla., as follows: In a pool of 58 fleas from 7 wood rats, *Neotoma* sp., and a pool of 4 fleas from 12 white-footed mice, *Peromyscus* sp. Infection was proved on June 29 by cultures and animal inoculation.

This is the first report of any plague infection being found in Oklahoma, and the locality is apparently the farthest east in which

infection in ectoparasites or wild rodents has been reported in the United States. Cimarron County borders on Union County, N. Mex., where infected fleas from grasshopper mice, *Onychomys leucogaster*, were found in May 1944 and June 1943, in localities 18–23 miles and 9–12 miles, respectively, south of Clayton. These localities, and Divide County, N. Dak. (1941), were the farthest east in which sylvatic plague infection had previously been found in the United States.

FOREIGN REPORTS

ANGOLA

Notifiable diseases—January–March 1944.—During the months of January, February, and March 1944, certain notifiable diseases were reported in Angola, as follows:

Disease	January		February		March	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Beriberi	16	3	5		7	1
Cerebrospinal meningitis	1		2	1		
Chickenpox	52		143		85	
Diphtheria	1		4	1		
Dysentery (amebic)	132	3	153	1	118	3
Dysentery (bacillary)			8		5	
Gonorrhea	227		220		207	
Hookworm disease	419	10	335	6	374	4
Influenza	741	16	600	11	994	5
Leprosy	9	1	8		5	
Measles	40		20		14	
Mumps	12		3		3	
Pneumonia (all forms)	164	21	115	9	151	23
Poliomyelitis	1		1			
Relapsing fever	14		20		14	
Sleeping sickness	84	11	114	6	210	13
Smallpox	18		2		2	
Syphilis	469	1	432		418	3
Tetanus	12	6	4	3	2	2
Trachoma	1		3			
Tuberculosis (respiratory)	52	5	53	3	50	7
Typhoid and paratyphoid fever	10	3	14		29	6
Whooping cough	193	2	118	2	145	5
Yaws	914		794	1	864	2

CANADA

Provinces—Communicable diseases—Week ended June 10, 1944.—During the week ended June 10, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		27		149	339	55	25	66	146	807
Diphtheria	2	3	1	14	5	3	1	1		30
Dysentery (bacillary)				7		1				8
German measles		11		142	90	4	47	2	42	338
Influenza		13			7	3			1	24
Measles		36	8	596	602	168	79	72	37	1,593
Meningitis, meningococcus				1	5	[illegible]			2	9
Mumps		6		138	181	23	6	41	40	435
Scarlet fever		7	6	60	145	39	18	87	85	447
Tuberculosis (all forms)		23	21	158	50	38	15	5	29	339
Typhoid and paratyphoid fever				11				1		12
Undulant fever				4	1					5
Whooping cough		17		40	33	32		2	22	146

FINLAND

Notifiable diseases—April 1944.—During the month of April 1944, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Actinomycosis	2	Mumps	606
Cerebrospinal meningitis	28	Paratyphoid fever	292
Chickenpox	526	Pneumonia (all forms)	1,966
Conjunctivitis	5	Poliomyelitis	14
Diphtheria	958	Puerperal fever	46
Dysentery	7	Rheumatic fever	274
Gastroenteritis	1,611	Scabies	2,031
Gonorrhea	611	Scarlet fever	967
Hepatitis, epidemic	602	Syphilis	320
Influenza	1,602	Typhoid fever	28
Laryngitis	23	Undulant fever	1
Malaria	2	Vincent's angina	8
Measles	2,440	Whooping cough	868

GREAT BRITAIN

England and Wales—Infectious diseases—5 weeks ended April 1, 1944.—During the 5 weeks ended April 1, 1944, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Cerebrospinal fever	417	Pneumonia	5,992
Diphtheria	3,380	Puerperal pyrexia and puerperal sepsis	831
Dysentery	1,278	Scarlet fever	11,446
Measles (exclusive of German measles)	11,711	Smallpox	15
Ophthalmia neonatorum	394	Typhoid fever	23
Paratyphoid fever	18	Whooping cough	10,231

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

India—Calcutta.—During the week ended June 17, 1944, 105 cases of cholera with 55 deaths were reported in Calcutta, India.

Plague

Egypt.—Plague has been reported in Egypt as follows: Week ended June 24, 1944—Ismailiya, 4 cases, 4 deaths, including 1 death in the southern area; Port Said, 4 cases, 1 death.

Madagascar.—For the period April 21–30, 1944, 3 cases of plague were reported in Madagascar.

Morocco (French).—For the month of May 1944, 6 cases of plague

were reported in Casablanca region and 26 cases of plague were reported in Rabat region, French Morocco.

Peru.—For the month of April 1944, plague was reported in certain departments of Peru, as follows: Ancash, 3 cases, 1 death; Lima, 1 case; Piura, 1 case, 1 death.

Smallpox

India—Calcutta.—For the week ended June 17, 1944, 109 cases of smallpox with 97 deaths were reported in Calcutta, India.

Mexico.—For the month of April 1944, 292 cases of smallpox were reported in Mexico, including 38 cases in Hidalgo State, 33 cases in Oaxaca State, and 92 cases in Vera Cruz State.

Morocco (French).—For the month of May 1944, 16 cases of smallpox were reported in French Morocco.

Nigeria.—For the week ended June 3, 1944, 138 cases of smallpox with 40 deaths were reported in Nigeria.

Peru.—For the month of April 1944, 22 cases of smallpox were reported in Peru, including 11 cases in Huancavelica Department and 5 in Junin Department.

Typhus Fever

Belgium.—For the period May 7–27, 1944, 2 cases of typhus fever were reported in Brabant and 5 cases of typhus fever were reported in Oostvlaanderen, Belgium.

Bolivia.—For the month of May 1944, 30 cases of typhus fever with 3 deaths were reported in Bolivia, including 8 cases with 2 deaths reported in La Paz city.

Bulgaria.—For the period March 23 to April 5, 1944, 169 cases of typhus fever, including 9 cases in Sofia, were reported in Bulgaria.

Chile.—For the 4 weeks ended May 20, 1944, 32 cases of typhus fever with 1 death including 10 cases in Antofagasta city and 6 cases in Valparaiso, were reported in Chile.

Colombia.—From the end of February to the beginning of June 1944, 72 cases of typhus fever were reported in Sonson, Antioquia Department, Colombia.

Ecuador.—For the month of April 1944, 33 cases of typhus fever with 3 deaths including 21 cases with 2 deaths in Quito, and 11 cases in Ambato, were reported in Ecuador.

Indochina.—For the period May 11–20, 1944, 105 cases of typhus fever were reported in Indochina. For the period March 21 to May 10, 1944, 692 cases of typhus fever were reported.

Mexico.—For the month of April 1944, 197 cases of typhus fever were reported in Mexico. The States reporting the highest incidence are as follows: Federal District, 33 cases; Guanajuato, 17 cases; Mexico, 40 cases; Oaxaca, 18 cases.

Morocco (French).—For the month of May 1944, 448 cases of typhus fever were reported in French Morocco.

Palestine.—For the month of May 1944, 80 cases of typhus fever with 12 deaths were reported in Palestine.

Peru.—For the month of April 1944, 104 cases of typhus fever including 13 cases in Arequipa Department, 17 cases in Huanuco Department, and 29 cases in Junin Department, were reported in Peru.

Spain.—For the week ended April 29, 1944, 16 cases of typhus fever were reported in Spain.

Yellow Fever

Bolivia.—For the month of May 1944, 4 cases of yellow fever were reported in Bolivia, including 1 case in the Department of La Paz and 3 cases in the Department of Santa Cruz.

Colombia.—For the months of January and February 1944, yellow fever was reported in Colombia as follows: Boyaca Department, 1 case, 1 death; Cundinamarca Department, 1 case, 1 death; Santander Department, 2 cases, 2 deaths.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PLANNING FOR HEALTH EDUCATION IN THE WAR AND POST-WAR PERIODS—THE STATE PROGRAM[1]

By J. C. KNOX, M. D., M. P. H., *Director, Division of Epidemiology, North Carolina State Board of Health*

The State is specifically charged by law with the responsibility for the health and welfare of all of the people within its borders. As long ago as 1879 North Carolina recognized this responsibility and commissioned the State Board of Health to "take cognizance of the health interests of the people of the State; make sanitary investigations and inquiries in respect to the people, employing experts when necessary; investigate the causes of diseases dangerous to the public health, especially epidemics, the sources of mortality, the effects of location, employments, and conditions upon the public health." It continues with a farsighted charge explicitly directed toward health education, that is, that the State Board of Health "shall gather such information upon these matters for distribution among the people with the especial purpose of informing them about preventable diseases."

Thus, the North Carolina State Board of Health is commissioned by law with the grave and enormous task of "taking cognizance of the health interests of the people of the State." "Health interest" is a comprehensive term and, interpreted broadly, may include not only the familiar phases of public health concerned with control and prevention, but also may well reach out to embrace that more recent vision of public health which is called by some "constructive medicine" and whose goal is that type of optimal physical fitness imagined by William James when he said "Merely to live, move and breathe is a delight!" This concept of public health is all-inclusive, involving certain aspects of the social and economic realms which heretofore have not been generally considered a field for public health activities; therefore, it is dependent upon personal security and the four freedoms.

This broad concept of the duties of the State health department is fundamental in planning for the post-war period, not only for recon-

[1] Read before the Public Health Education and Health Officers' Sections, American Public Health Association meeting, New York City, Oct. 12, 1943.

struction and rehabilitation but also for the kind of America and Americans envisioned by our best democratic leaders.

Education is the pipe-line system for the distribution of information to all people. Through education in its many phases, and especially through health education that provides stimulation, knowledge, and experience essential to physical and emotional well-being, will we strive to reach those comprehensive and farsighted goals set up for modern public health.

May I again emphasize the phrase "all the people." The State health department is specifically charged by law to be cognizant of the health interests of "all the people." The pipe line of health education must necessarily reach them. This physical and emotional well-being that we envision in post-war America is for everybody. The health department is the one State department that is responsible for all the people. The schools deal with specific age groups, welfare with specific economic groups, but the health department must reach everyone, regardless of age or economic level. The development of such a program, which would include all, may require certain fundamental changes in existing health education programs.

While no clear-cut, accepted pattern has been designed for State health education programs or for essential health education personnel up to this time, State programs may be said to have fallen into two general types. In the first, the State departments of health, State departments of education, and institutions of higher learning assume a joint responsibility for developing health education programs. In the second, the State department of health provides an advisory service in health education to local communities through trained personnel employed by the department (*1*).

In Oregon and Tennessee, the State department of health, the State department of education, and institutions of higher learning have pioneered in working together on the health education needs of their States and in planning action programs. Local communities have been stimulated to adopt these programs (*1*). In North Carolina the State Board of Health and the State Department of Education have been working together for some time trying to solve school health problems. There are, however, few all-inclusive State programs in health education which recognize that there are many groups, both official and nonofficial, that have responsibility for certain phases of health education.

In many States the health education division of the State department of health, in addition to its advisory function, is also responsible for the preparation of health bulletins, news releases, lectures, exhibits, posters, radio talks, and popular leaflets. In others, library service, staff education, teacher training, and refresher courses for

various professional and lay groups are an additional function of such a division.

When the basic health education services on the State level are purely advisory, the State health educators necessarily must function through other people in local health and school departments and through professional and lay groups closely allied to public health. One State director of health education (*2*), in describing this function, says that materials are sent to public health officers, public health nurses, and superintendents of schools with the hope that they will be used. Too often State departments send out materials and directives that fail to result in definite action. Sometimes these materials are thrown immediately into the overflowing local wastepaper baskets. When health education on the local level is everybody's task it is nobody's specific responsibility. Consequently, great reserves of lay ability are never tapped. Today, when problems are mounting on the home front in rapid succession and health department personnel is as rapidly being depleted, there never was a greater need for the carefully organized and guided utilization of lay individuals and lay groups.

Recently a health educator in a North Carolina county health department, who had previously worked in a State health department, remarked upon the great satisfaction derived from actually doing the job. She had written hundreds of suggestions for health officers, school superintendents, public health nurses, P. T. A. presidents, and civic leaders, but now she plans programs with those local leaders, programs that are suited to specific community needs. Through neighborhood and block study groups she feels that she is reaching out to all the people in a manner never possible on the State level. The awakening of lay responsibility for community health and welfare has truly been a novel and satisfying experience for this health educator.

During the past decade there has been a steady trend toward placing the emphasis of a State health education program at the local level. One State director of health education has said, "Increasing emphasis is being placed on the States' health education activities at the local level." Strong local lay committees are developed to stimulate year-round lay participation in community activities for health promotion on the local level. Doubtless this trend will be given added impetus by the stimulation created in the establishment of those demonstrations in community health education which are now being sponsored by the United States Public Health Service in cooperation with the North Carolina State Board of Health, South Carolina State Board of Health, and Oklahoma State Department of Health.

Health educators of the United States Public Health Service, although assigned to regional and State offices, go directly to county health departments chosen by the State health officer and work there as members of the local staff. Here are utilized all available local, State, and Federal resources, and a county-wide community health education program is developed, based upon lay interest and participation. The usual duties of the health educator in a community program are carried on as a part of the broader public health program, which is built upon the interest of both professional and lay citizens; thus, the program truly becomes one of the vital activities of the community.

In North Carolina five health educators were assigned to the State Board of Health by the United States Public Health Service. Early in the program a training course for health educators was established in the School of Public Health at the University of North Carolina. Health educators trained on North Carolina State Board of Health scholarships are now replacing all the workers assigned by the Public Health Service, and eight others have just begun their training at the University.

A health educator in every local health department is the goal of the North Carolina State Board of Health, with three district supervisors and a State director of health education in the central office. In addition, we feel that a special section of visual aids on the State level is necessary. This materials production unit should include an artist, a photographer, two writers, a carpenter, and a librarian to produce and distribute the "tools of the trade" that will be used by local health departments. A supervisor of films and two technical assistants, together with the required clerical assistants, are necessary for an efficiently managed program of visual aids.

The idea for a health museum for each State health department seems reasonable. If the museum were portable, perhaps of a trailer type, it could better serve the local health departments, and, consequently, the people.

The experience gained in North Carolina indicates that the sound State program for health education is based, first, upon sound local programs carried on by trained health educators under the direction of the local health officer. Such local health education programs provide the State director and district supervisors of health education with straight, vital channels to the people. Then, when techniques and materials are developed on the State level, they are sure to be wisely adapted to local needs and therefore become far more useful. Specific health programs concerned with other agencies and groups can be guided and facilitated in each community by this person well trained in human relationships. When health education programs

function on the local level, the duties of coordination and evaluation of these programs become paramount on the State level, and on the local level the task of the health educator is the practical, everyday application of the democratic process, attempting always to inspire, instruct, and lead to action. The accomplishment of this task is a challenge to the ingenuity of the health educator; however, such a project cannot succeed, even with a health educator in every health department and consultants on the State level, unless adequate educational tools for health instruction are the responsibility of departments of education. Colleges and universities, therefore, should recognize and accept their responsibility for providing teacher training, which in turn will prepare teachers to instruct students effectively in matters pertaining to health.

It should be emphasized that a plan for a State program for health education, based on sound local programs, cannot be established and maintained on the usual minimum budget customarily earmarked for health education. In the modern health department, health education serves in a capacity comparable in importance to older established services. Indications are that in the future even greater emphasis will be placed upon preventive programs in public health, and consequently, greater emphasis upon health education. Surely the time has come to make adequate appropriation for this essential service.

"Creative powers of the people are at the grass roots," says Emory S. Bogardus in Democracy by Discussion. In North Carolina capable leadership of local community health education programs has been formed in all groups without regard for social, economic, or racial backgrounds People have realized, some of them for the first time, that they have a real responsibility for the health and welfare of their neighbors. They have realized, too, that their own apathy and indifference have allowed certain social and economic conditions to exist that they now know must be changed. The democratic spirit that is so greatly needed in the world today is exemplified by this type of program. People think together, study together, and then act together. Many of the people formerly thought that the exclusive duty of the health department was to care for Negroes and poor whites. Now, a new concept of the scope and caliber of health department service and capabilities is slowly spreading. The composite essential parts of the total health program of tomorrow promise to be: communicable disease control, sanitation, maternal and infant care, school health programs, nutrition, dental health, mental hygiene, housing, social and economic welfare, and certain aspects of medical care. The responsibility of the State is to all the people, and, through democratic health education, the departments

of public health can best attempt to bridge the gap between knowledge and skill, and thus discharge this serious obligation entrusted to them by law.

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PLANNING FOR HEALTH EDUCATION IN THE WAR AND POST-WAR PERIODS—THE LOCAL PROGRAM [1]

By Hugh B. Robins, *Director, Calhoun County Health Department, Marshall, Michigan*

The title, "Planning for Health Education in the War and Post-war Periods," is somewhat misleading, because in public health practice there is no program of public health education, but rather an attempt is made to apply the principles of education to all public health programs.

The past decade has seen an enormous increase in the application of the principles of public health education by those concerned with the public health. When the war began these principles were already being tried out in most public health programs. What changes, if any, must be made in health education plans for the war and post-war periods? It would seem that the change in problems will decide the changes in planning.

The war has brought great changes in the health problems of all communities. It has also reshuffled their relative importance. Many problems, such as the employment of large numbers of women in industry, are entirely new to us. Some old problems, such as the dangers from some of the communicable diseases, have been increased. It is hard to think of an old problem that has been lessened.

Resources to meet these problems have been drastically cut; all communities have lost professional personnel such as physicians, dentists, nurses, teachers, veterinarians, and technicians; the modernizing or building of new houses has been restricted; sanitary supplies are limited; and even travel is curtailed. This brings us to the conclusion that each individual, family, and group must do more for themselves. How can they do this in the face of shrinking resources?

It is pertinent here to ask "Why, about what, who, and how" do we plan for health education in the community health program. It would seem obvious that the answers to these questions are not

[1] Read at the first session of the Public Health Education Section of the American Public Health Association, New York City, Oct. 12, 1943.

necessarily the same for any two individuals, groups, or communities, or for two different periods of time. The factors influencing health are changing with unusual speed.

The purpose of health education, broadly speaking, is to assist the people in defining their health problems and in utilizing to the utmost the resources in planning and in doing something about these problems to the end that they live in such a manner as to promote the optimum of health.

What should be included in our health education? Here it is expedient to fall back upon the arbitrary divisions of public health—maternal and child health, adult health, environmental sanitation, communicable disease control, industrial health, mental health, nutrition, accident prevention, disease prevention such as cancer control, and general medical care, including medical, dental, nursing, and hospital care. Because of the tremendous scope presented by the foregoing, it is necessary to make some sort of an evaluation so that the most important problems be given proper emphasis. The evaluation schedule of the American Public Health Association is the best tool available for this purpose.

Once the health problems are cataloged and placed in relative order of importance, the next question is "Who is to be educated?" Since health problems are not static, and new information is being accumulated constantly from human experience, it is necessary, first, to design an "in-service" program for the health department staff. Constant study and attempt at self-improvement are the price which must be paid if we aspire to leadership in promoting the community health program. Next, we turn to our professional colleagues, the doctors, dentists, teachers, nurses, veterinarians, etc. Then we consider other official and nonofficial agencies, lay groups, and finally, the parents and individuals.

In considering how to plan health education, the staff must have certain operating policies, such as group teaching wherever possible, promotion of local leadership, working with and through existing organizations whenever practical, and learning by doing. These suggest a pattern for community organization.

Three illustrations showing how the nurse, engineer, and health officer have used this method in Calhoun County follow:

A young physician living in a small village, located in one of the nursing districts, was interested in obstetrics, and he did a good job of prenatal care for his patients. The public health nurse supplemented his care and there was good team work. In 1942 the physician decided to join the Army. His patients would have to be scattered among the physicians of surrounding villages, which were at considerable distances. The nurse asked the physician if he thought it worth

while to try to develop prenatal group conferences. He thought it was a fine idea and a series of conferences was planned. The health officer took these plans to the Public Health Committee of the County Medical Society and they made some suggestions. The physicians in the surrounding villages were approached, and they also made suggestions. Calls were made on a few of the prenatal patients, who liked the idea, and said they would attend. A church and then a library and a school were tried out as places of meeting. The physician's wife became interested in the plan and reopened his office for the meetings. The local library maintained a shelf of reference material. Conferences were held regularly each month and the supplemental work went on.

This program has been continued and, as a result, some of the people have begun to consider the advisability of having conferences on child growth and development.

The engineer of the health department became concerned because about one-third of the market milk was distributed unpasteurized, and it was noted that undulant fever was on the increase. He called a meeting of the pasteurizing plant operators and offered them the opportunity of playing the leading role in a campaign for clean, safe milk. They hesitated because they knew this meant making considerable improvement in their own plants. The health officer and the engineer then conferred with the professional groups to discuss the problem. The county medical society, the dental society, the Schoolmasters' Club, and the veterinarians endorsed the pasteurization of all market milk. Consumer demand was developed, the press was utilized, the county extension agent and 4-H Club leaders were enlisted, and discussions were held with the teachers who were operating hot-lunch programs. Through the county school commissioner the school boards learned of their responsibility in milk-borne epidemics. The engineer designed a chart explaining the method of pasteurizing milk at home, and these were distributed to the homes by the rural school children. The pressure increased and the consumption of raw milk began to decrease. The raw milk distributors, one by one, either equipped their plants for pasteurization, sold their supply to a pasteurization plant, or went out of business.

When the milk supply of a village or city became largely pasteurized, an ordinance was suggested to the council. It was pointed out that the law was not intended as a club over the industry, but as a protection both to the consumer and to those plants that had increased their investment by providing cleaner, safer milk. A striking change in attitude toward the engineer has developed among those in the milk industry. He is no longer looked upon as a police officer, but as a friendly technical adviser. This change has come about through education and not by law.

As a third illustration, let us consider the tuberculosis program. The plan here is the same: What is the problem, what resources are available, and how can they be used most effectively?

From reports of cases and deaths in Calhoun County over a period of years, it was learned that tuberculosis was concentrated in the industrial areas, and was most prevalent among the Negroes and foreign-born whites. A review of the facilities at hand revealed a county medical society, a county tuberculosis hospital, a county tuberculosis society, local hospitals, organized industrial groups, schools, and a State Bureau of Tuberculosis Control. The time-honored "pick and hunt" method of following up contacts to known cases had been used. In 1942, only 17 percent of the cases reported were in the incipient stage of the disease.

After discussions with resource groups, it was decided that a chest X-ray was needed as a part of the industrial pre-employment examination, but talks with personnel managers and labor leaders brought no results. It was then agreed that mass-surveying with a mobile X-ray unit was the next best thing. Areas of responsibility were set up in the group. The county medical society endorsed the plan and requested the use of the State Department's mobile X-ray unit. The county tuberculosis society conferred with labor and management, and set up a calendar for the unit. Labor unions held meetings and voted to cooperate. All original films taken by the mobile unit were read at the State Department of Health. All suspicious small (4" x 5") films were rechecked on 14" x 17" film at local hospitals. The local hospitals offered a special rate for this work and sent the films to the county hospital for reading. The tuberculosis society and the county health department divided the cost of these rechecks. Notifications for rechecks were carried out jointly by the personnel of the county health department, the county tuberculosis society, and the county hospital. The family physicians were given copies of the reports of findings on the large X-rays, and, together with the director of the county hospital, made a decision as to necessary hospitalization of active cases found. The follow-up work was done by the public health nurses. In all, 13,000 persons were examined and 45 cases were found; of these 20 were minimal, 18 moderately advanced, and 7 far advanced.

While arranging for the mobile X-ray unit to invade the industrial area, the health department staff assisted with a general education program of lectures, movies, posters, and school programs, sponsored by the health department and the tuberculosis society in these areas.

Further discussions with the part-time physicians working with industry have resulted in their arranging for five plants to include an X-ray in the pre-employment examination. This idea has been worked out by the physicians with the local hospitals of which they

are staff members. At last one of our long-range objectives is being reached.

Incidentally, the Christmas tuberculosis seal sale this year netted a little over $10,000, or 10 cents per capita, including gifts of $400 each from two unions, and $500 from one industry. The 1941 seal sale netted approximately $5,000.

These illustrations suffice to make clear that the health department staff does not try to "run" the health programs in Calhoun County. Rather, we feel that the department is one of the many resources available to the people, particularly fitted to act as the coordinating agency. In fact, it has been a definite policy of the health department to minimize its own importance and attempt to strengthen other groups, such as the Schoolmasters' Club, 4-H Clubs, Parent-Teacher Association, etc.

In the past it has been the good fortune of the health department to have unusual resources in consultants on health education, such as Dr. Henry Otto, formerly of the W. K. Kellogg Foundation, who was available for all educational programs, and Miss Vivian Drenckhahn, of the University of Michigan, who worked intensively with the teachers in the county. These persons are no longer available. Assistance from the State Department of Health and Department of Public Instruction cannot provide such intensive help as we would like. We now feel that there should be a health educator on our own staff, who would be available to the entire community in planning the health program.

In conclusion, we should not be unmindful that in public health we still have the privilege of applying democratic principles in the conduct of our work.

TUBERCULOSIS MORTALITY AMONG RESIDENTS OF THE 92 CITIES OF 100,000 OR MORE POPULATION: UNITED STATES, 1939–41 [1]

By Dorothy J. Liveright, *Junior Statistician, United States Public Health Service*

The tuberculosis problem is relatively greater in cities than in rural areas. One out of every 3 persons who died from tuberculosis in the 3-year period 1939–41 was a resident of a city of 100,000 or more population. The death rate from tuberculosis per 100,000 population was 55.4 in these large cities, 43.5 in places of 2,500 to 100,000 population, and 41.1 in rural areas.

The rate of 55.4 is obviously an average figure relating to the combined populations for all the large cities. Of more practical value

[1] From the Tuberculosis Control Section, States Relations Division.

are the rates for individual cities. These vary from the very low rate of 15.6 to the very high rate of 151.7. Whatever the reasons for such wide variability may be, the first requisite for a control program is the determination of the magnitude of the problem. The death rate for an individual city becomes more meaningful as an index and as a guide to administrative action when it is compared with the rates in other cities of its size. From such a comparison it becomes possible to institute more searching analysis of the factors responsible for the high rates in some cities, and, in turn, a theoretically attainable goal emerges from investigation of the low rates in others.

It is the object of this paper to assemble the tuberculosis mortality rates for all the cities of 100,000 or more population in the United States and to rank them according to their tuberculosis death rate in several ways.

For a number of years, Drolet, of the New York Tuberculosis and Health Association, has compiled annual tabulations of tuberculosis mortality in large American cities. Recently the National Tuberculosis Association has continued this useful work for 42 of the 43 cities of 200,000 or more population.[2] The data for these tabulations were obtained from the individual cities. The present tabulations are based on data from the United States Bureau of the Census and cover the 3-year period 1939–41, centering around the census year of 1940. They therefore have the benefit of the more accurate population data which are available at a census year, and the advantage of uniformity resulting from central tabulation. The rates are also more stable since they cover a 3-year period, and may therefore be used as a base line for the evaluation of future annual tabulations.

Among the factors known to be closely related to tuberculosis are race, age, and sex. The nonwhite rate is more than three times as high as the white. The tabulations are therefore presented separately for whites and nonwhites whenever data are available. Information for individual cities which is sufficient for complete standardization by age and sex is not published by the Bureau of the Census, and consequently the rates have not been corrected for differences in these factors. However, it is felt that such rate standardization would not materially alter the ranking of the cities, and that the crude rates are sufficient for the purposes of this paper.

Tabulations are presented which rank all the 92 cities of 100,000 or more population according to their tuberculosis mortality rate, starting with the city having the lowest rate, which is ranked first, up to the city with the highest rate, which is ranked ninety-second. The ranking is also done separately by color for those cities for which such

[2] Tuberculosis Mortality Among Residents of Large American Cities, National Tuberculosis Association, 1941.

data are available. Rankings of the cities are also presented in 4 size-of-city groups, as follows:

Cities of 100,000 to 200,000 population.
Cities of 200,000 to 500,000 population.
Cities of 500,000 to 1,000,000 population.
Cities of 1,000,000 and over.

In addition, the cities are ranked within 5 broad geographic divisions.

From these tabulations, it becomes possible for each city to determine its position relative to all the 92 large cities, or in relation to a narrower group which more nearly approximates it in size or in geographic location. It should be noted that from the ranking of the 92 cities it also is possible for each city to determine its position in relation to any other subgrouping of the cities which may be desired. It is merely necessary to select all the cities in the subgrouping and renumber the ranking orders.

Since it is difficult to find a given city in the tables, an appendix table (table 10) is presented for easy reference. This table presents the cities in alphabetical order, and shows for each city its position among all 92 as well as its rank within the size-of city group and geographic division in which it falls.

THE RELATIVE POSITION OF EACH OF THE 92 CITIES

Table 1 presents the 92 cities of 100,000 or more population ranked according to their mortality rate from tuberculosis (all forms) for all races combined. The table presents, in addition to the tuberculosis death rate, the enumerated population of each city, the number of deaths from tuberculosis in the 3-year period 1939–41, and the percentage of the population and of the tuberculosis deaths that were nonwhite.

TABLE 1.—*Mortality from tuberculosis (all forms) in the 92 cities of over 100,000 population: United States, 1939–41 (all races)*

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Population—1940	Total deaths from tuberculosis—1939–41	Percent nonwhite population	Percent [1] nonwhite deaths
1	Grand Rapids, Mich	15.6	164,292	77	1.7	---
2	Salt Lake City, Utah	19.8	149,934	87	.8	---
3	Minneapolis, Minn	20.9	492,370	308	1.1	
4	Des Moines, Iowa	22.7	159,819	109	4.0	
5	Spokane, Wash	23.8	122,001	87	.9	
6	Akron, Ohio	25.1	244,791	184	5.0	---
7	Duluth, Minn	25.1	101,065	76	.4	---
8	Flint, Mich	25.5	151,543	116	4.4	---
9	Wichita, Kans	26.4	114,966	91	5.0	---
10	Long Beach, Calif	26.6	164,271	131	1.0	---
11	St Paul, Minn	26.8	287,736	231	1.5	
12	Peoria, Ill	27.0	105,087	85	2.7	---
13	Springfield, Mass	27.2	149,554	122	2.1	---
14	Somerville, Mass	27.7	102,177	85	.3	---
15	Utica, N. Y	30.8	100,518	93	.5	---
16	Rochester, N. Y	31.5	324,975	307	1.1	---
17	Portland, Oreg	31.9	305,394	292	1.9	---
18	Syracuse, N. Y	32.0	205,967	198	1.1	---
19	Paterson, N. J	32.2	139,656	135	2.1	---

TABLE 1.—*Mortality from tuberculosis (all forms) in the 92 cities of over 100,000 population: United States, 1939–41 (all races)*—Continued

Rank	City	Rate	Population—1940	Total deaths from tuberculosis 1939-41	Percent nonwhite population	Percent [1] nonwhite deaths
20	New Haven, Conn	33.0	160,605	159	3.9	----------
21	Omaha, Nebr	34.9	223,844	234	5.5	----------
22	Lowell, Mass	35.2	101,389	107	.1	----------
23	Worcester, Mass	35.6	193,694	207	.7	----------
24	Hartford, Conn	36.1	166,267	180	4.3	----------
25	Erie, Pa	36.5	116,955	128	1.2	----------
26	South Bend, Ind	36.9	101,268	112	3.6	----------
27	Yonkers, N. Y	37.6	142,598	161	2.9	----------
28	Bridgeport, Conn	38.5	147,121	170	2.6	----------
29	Oklahoma City, Okla	39.0	204,424	239	9.6	----------
30	Milwaukee, Wis	39.3	587,472	693	1.6	----------
31	Providence, R. I	39.5	253,504	300	2.6	----------
32	Youngstown, Ohio	39.6	167,720	199	8.7	----------
33	Scranton, Pa	39.7	140,404	167	.5	----------
34	Elizabeth, N. J	40.0	109,912	132	4.6	----------
35	Tacoma, Wash	40.2	109,408	132	1.6	----------
36	Oakland, Calif	40.5	302,163	367	4.7	----------
37	Fort Wayne, Ind	40.5	118,410	144	2.1	----------
38	Canton, Ohio	40.6	108,401	132	3.8	----------
39	Kansas City, Kans	43.6	121,458	159	17.3	43.4
40	Charlotte, N. C	45.6	100,899	138	31.1	73.2
41	Albany, N. Y	45.7	130,577	179	2.3	----------
42	San Diego, Calif	46.9	203,341	286	3.1	----------
43	Fort Worth, Tex	47.8	177,662	255	14.3	30.6
44	Buffalo, N. Y	48.0	575,901	830	3.2	----------
45	Cambridge, Mass	48.4	110,879	161	4.5	----------
46	Seattle, Wash	48.8	368,302	539	3.9	----------
47	New Bedford, Mass	50.1	110,341	166	4.0	----------
48	Reading, Pa	50.4	110,568	167	1.7	----------
49	Wilmington, Del	50.7	112,504	171	12.7	37.4
50	Detroit, Mich	50.7	1,623,452	2,468	9.3	34.6
51	Fall River, Mass	50.8	115,428	176	.4	----------
52	Kansas City, Mo	51.4	399,178	616	10.5	36.5
53	New York, N. Y	51.5	7,454,995	11,507	6.4	26.5
54	Camden, N. J	51.9	117,536	183	10.7	32.8
55	Pittsburgh, Pa	52.3	671,659	1,053	9.3	32.5
56	Louisville, Ky	53.4	319,077	511	14.8	44.4
57	Denver, Colo	54.7	322,412	529	2.7	----------
58	Indianapolis, Ind	54.9	386,972	637	13.2	40.5
59	Los Angeles, Calif	55.6	1,504,277	2,507	6.5	16.1
60	St. Louis, Mo	55.6	816,048	1,362	13.4	42.4
61	Columbus, Ohio	55.8	306,087	512	11.7	39.5
62	Jersey City, N. J	56.8	301,173	513	4.5	----------
63	Miami, Fla	57.5	172,172	297	21.5	60.6
64	Dallas, Tex	57.6	294,734	509	17.1	34.8
65	Tampa, Fla	59.7	108,391	194	21.5	54.6
66	Boston, Mass	60.3	770,816	1,394	3.3	11.8
67	Cleveland, Ohio	60.8	878,336	1,601	9.7	37.4
68	Knoxville, Tenn	62.1	111,580	208	14.4	40.4
69	Chicago, Ill	62.4	3,396,808	6,357	8.3	33.3
70	Philadelphia, Pa	65.1	1,931,334	3,773	13.1	40.9
71	Newark, N. J	65.2	429,760	841	10.8	45.4
72	Toledo, Ohio	66.1	282,349	560	5.2	----------
73	Gary, Ind	66.2	111,719	222	18.3	50.0
74	Tulsa, Okla	67.1	142,157	286	11.1	38.8
75	Cincinnati, Ohio	67.2	455,610	919	12.2	44.3
76	San Francisco, Calif	67.4	634,536	1,282	5.0	14.0
77	Trenton, N. J	67.4	124,697	252	7.5	----------
78	Dayton, Ohio	[2] 67.4	210,718	426	9.6	----------
79	Richmond, Va	67.5	193,042	391	31.8	63.7
80	Houston, Tex	74.4	384,514	858	22.5	40.7
81	Nashville, Tenn	79.3	167,402	398	28.3	54.8
82	Norfolk, Va	80.6	144,332	349	31.9	71.3
83	New Orleans, La	81.0	494,537	1,201	30.3	53.0
84	Baltimore, Md	82.1	859,100	2,116	19.4	54.1
85	Washington, D. C	82.7	663,091	1,645	28.5	66.9
86	Birmingham, Ala	83.7	267,583	672	40.7	75.4
87	Atlanta, Ga	86.5	302,288	784	34.6	75.4
88	Memphis, Tenn	89.1	292,942	783	41.5	78.9
89	Jacksonville, Fla	89.4	173,065	464	35.7	79.3
90	Sacramento, Calif	97.5	105,958	310	5.8	----------
91	Chattanooga, Tenn	113.7	128,163	437	28.4	61.1
92	San Antonio, Tex	151.7	253,854	1,155	7.5	----------

[1] Figures available only for cities with more than 20,000 nonwhites, or more than 10 percent nonwhite population.

[2] The nonwhite population of Dayton, Ohio, satisfied the conditions for inclusion at 1940 Census, but was less than 20,000 before that year, and consequently the tabulations on tuberculosis mortality by race are not available.

The enormous variability in the rate is immediately apparent. The highest rate (San Antonio) is nearly ten times as high as the lowest (Grand Rapids). Even excepting the cities having abnormally high rates, the rates in the remaining cities show a gradual variation over the very wide range of 20 to 90. Half of the cities have rates of more than 50, one-quarter have rates of less than 36, and a like number exceed 65.

A comparison of the last two columns in table 1 yields a picture of the magnitude of the tuberculosis problem among the nonwhite population. The proportions of tuberculosis deaths that were nonwhite are approximately three times as great as the percentages which the nonwhites formed of the populations of the different cities. Although in no city are the nonwhites more than 42 percent of the total population, the nonwhite tuberculosis deaths account for almost 80 percent of all the tuberculosis deaths in one city.

The very high rates in such cities as San Antonio and Sacramento may be due to their large Mexican populations. Mexicans are enumerated among the whites, and it is consequently not possible to show separate rates for the North Americans and Latin Americans in these cities.

Table 2 ranks the 92 cities according to their tuberculosis mortality rate among whites. Data for cities in which the nonwhite population is less than 10 percent of the total, or which contain fewer than 20,000 nonwhites, are not tabulated by race in the Bureau of the Census publications. For such cities, the total rate (all races) is also used in the ranking of the white rate. While table 1 presents a picture of the cities in respect to the total tuberculosis problem, the ranking shown in table 2 affords a comparison between the cities without the complicating factor arising from differences in the proportions of the nonwhite population. Thus, it will be noted by a comparison of the two tables that many of the southern cities which have high ranking numbers in table 1 attain relatively low rates in table 2. For example, Charlotte, N. C., which ranked fortieth in the rate for all races combined, stands in second place when only the rate for whites is considered. Similar reductions in ranking order are attained by Jacksonville, Miami, Atlanta, Birmingham, and most of the other southern cities. Conversely, many of the northern cities whose ranks were low according to the rate for all races have relatively high rankings when the rate among whites is used as the yardstick.

In table 3 the 39 cities which satisfy the requirements of the Bureau of the Census for tabulation by race, that is, which have a greater than 10 percent nonwhite population or more than 20,000 nonwhites, are ranked according to their tuberculosis rate among nonwhites. It is striking that the lowest rate in any of the cities is above 100, and that the rate goes up as high as 275 per 100,000 population.

TABLE 2.—*Mortality from tuberculosis (all forms) in the 92 cities of over 100,000 population: United States, 1939–41 (white)* [1]

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Rank	City	Rate
1	Grand Rapids, Mich	15.6	47	Pittsburgh, Pa	38.9
2	Charlotte, N. C	17.8	48	Oklahoma City, Okla	39.0
3	Salt Lake City, Utah	19.3	49	Camden, N. J	39.1
4	Minneapolis, Minn	20.9	50	Milwaukee, Wis	39.3
5	Des Moines, Iowa	22.7	51	Providence, R. I	39.5
6	Spokane, Wash	23.8	52	Youngstown, Ohio	39.6
7	Akron, Ohio	25.1	53	Memphis, Tenn	39.7
8	Duluth, Minn	25.1	54	Scranton, Pa	39.7
9	Flint, Mich	25.5	55	Newark, N. J	39.9
10	Wichita, Kans	26.4	56	Elizabeth, N. J	40.0
11	Long Beach, Calif	26.6	57	Tacoma, Wash	40.2
12	St. Paul, Minn	26.8	58	New York, N. Y	40.4
13	Peoria, Ill	27.0	59	Gary, Ind	40.5
14	Springfield, Ill	27.2	60	Fort Wayne, Ind	40.5
15	Somerville, Mass	27.7	61	Oakland, Calif	40.5
16	Jacksonville, Fla	28.8	62	Canton, Ohio	40.6
17	Miami, Fla	28.9	63	Cleveland, Ohio	42.1
18	Kansas City, Kans	29.9	64	Cincinnati, Ohio	42.7
19	Utica, N. Y	30.8	65	Knoxville, Tenn	43.3
20	Rochester, N. Y	31.5	66	Philadelphia, Pa	44.3
21	Portland, Oreg	31.9	67	Dallas, Tex	45.3
22	Syracuse, N. Y	32.0	68	Chicago, Ill	45.4
23	Paterson, N. J	32.2	69	Albany, N. Y	45.7
24	Atlanta, Ga	32.5	70	Tulsa, Okla	46.2
25	New Haven, Conn	33.0	71	Baltimore, Md	46.8
26	Norfolk, Va	33.9	72	San Diego, Calif	46.9
27	Tampa, Fla	34.5	73	Buffalo, N. Y	48.0
28	Birmingham, Ala	34.7	74	Cambridge, Mass	48.4
29	Louisville, Ky	34.8	75	Seattle, Wash	48.8
30	Omaha, Nebr	34.9	76	Los Angeles, Calif	49.7
31	Lowell, Mass	35.2	77	Nashville, Tenn	50.0
32	Worcester, Mass	35.6	78	New Bedford, Mass	50.1
33	Richmond, Va	35.9	79	Reading, Pa	50.4
34	Hartford, Conn	36.1	80	Fall River, Mass	50.8
35	Wilmington, Del	36.3	81	New Orleans, La	54.6
36	Detroit, Mich	36.5	82	Denver, Colo	54.7
37	Erie, Pa	36.5	83	Boston, Mass	55.0
38	Kansas City, Mo	36.5	84	Jersey City, N. J	56.8
39	South Bend, Ind	36.9	85	Houston, Tex	56.9
40	St. Louis, Mo	37.0	86	San Francisco, Calif	61.0
41	Yonkers, N. Y	37.6	87	Chattanooga, Tenn	61.8
42	Indianapolis, Ind	37.6	88	Toledo, Ohio	66.1
43	Columbus, Ohio	38.2	89	Dayton, Ohio	[2] 67.4
44	Washington, D. C	38.3	90	Trenton, N. J	67.5
45	Bridgeport, Conn	38.5	91	Sacramento, Calif	97.5
46	Fort Worth, Tex	38.7	92	San Antonio, Tex	151.7

[1] For cities having small nonwhite populations, the rate for "all races" is used

[2] The nonwhite population of Dayton, Ohio, satisfied the conditions for inclusion at 1940 Census, but was less than 20,000 before that year, and consequently the tabulations on tuberculosis mortality by race are not available.

TABLE 3.—*Mortality from tuberculosis (all forms) in 39*[1] *cities of over 100,000 population: United States, 1939–41 (nonwhite)*

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Rank	City	Rate
1	Fort Worth, Tex	102.7	21	Norfolk, Va	180.1
2	Charlotte, N. C	107.2	22	Gary, Ind	180.7
3	Kansas City, Kans	109.2	23	Pittsburgh, Pa	182.6
4	Dallas, Tex	116.9	24	Columbus, Ohio	187.5
5	Houston, Tex	134.4	25	Atlanta, Ga	188.3
6	Richmond, Va	135.3	26	San Francisco, Calif	188.5
7	Los Angeles, Calif	137.3	27	Detroit, Mich	189.0
8	New Orleans, La	141.6	28	Washington, D. C	194.3
9	Wilmington, Del	148.9	29	Jacksonville, Fla	198.4
10	Tampa, Fla	151.3	30	Philadelphia, Pa	203.5
11	Nashville, Tenn	153.5	31	New York, N. Y	213.0
12	Birmingham, Ala	155.1	32	Boston, Mass	215.7
13	Memphis, Tenn	158.8	33	Baltimore, Md	229.2
14	Camden, N. J	159.5	34	Tulsa, Okla	234.1
15	Louisville, Ky	160.3	35	Cleveland, Ohio	235.1
16	Miami, Fla	162.3	36	Cincinnati, Ohio	243.3
17	Indianapolis, Ind	167.9	37	Chattanooga, Tenn	244.4
18	Knoxville, Tenn	173.9	38	Chicago, Ill	250.1
19	St. Louis, Mo	176.0	39	Newark, N. J	275.5
20	Kansas City, Mo	179.3			

[1] Cities included in this table are those with more than 20,000 nonwhites, or more than 10 percent nonwhite population.

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RELATIVE POSITION OF THE CITIES WHEN CLASSIFIED BY SIZE-OF-CITY GROUPS

Although no striking difference in average rate is noted when the 92 cities are classified into narrower population size groups, it is nevertheless desirable to bring together the cities which are more comparable as to size. It may be of interest to review briefly the variation in the tuberculosis mortality rate according to size of city. Table 4 presents the mortality rate for each of the 4 size-of-city groups by race, in

TABLE 4.—*Mortality from tuberculosis (all forms) among residents of cities of over 100,000 population classified by size of city and by race United States, 1939–41*

Size of city	Number of cities	Average annual tuberculosis death rate	Population 1940	Number of deaths from tuberculosis, 1939–41	Percent nonwhite population	Percent nonwhite deaths
ALL RACES						
All cities	92	55.4	37,987,989	63,086	8.7	30.0
100,000–200,000	49	46.1	6,499,565	8,987	7.2	25.8
200,000–500,000	29	56.7	9,120,599	1[illegible],511	9.9	29.3
500,000–1,000,000	9	61.8	6,456,959	11,8[illegible]6	10.4	34.3
1,000,000 and over	5	55.8	15,910,866	26,612	7.9	29.9
WHITE						
All cities	92	42.4	34,687,522	44,155		
100,000–200,000	49	36.9	6,029,221	6,672		
200,000–500,000	29	44.5	8,220,549	10,971		
500,000–1,000,000	9	45.3	5,788,018	7,870		
1,000,000 and over	5	42.4	14,649,734	18,642		
NONWHITE						
All cities	39	191.2	3,300,467	18,931		
100,000–200,000	15	164.1	470,344	2,315		
200,000–500,000	12	168.1	900,050	4,540		
500,000–1,000,000	7	204.7	668,941	4,106		
1,000,000 and over	5	210.7	1,261,132	7,970		

addition to the percentages of the population and of the tuberculosis deaths which are nonwhite. The rates for all races and for whites do not vary consistently with size of city. The highest rate in both cases is found for cities of 500,000 to 1,000,000 population, and the lowest rate is recorded for cities of 100,000 to 200,000 population. The nonwhite rates, on the other hand, follow the size-of-city trend exactly, with the largest cities showing the highest rate.

The ranking of the individual cities in these narrower groups is presented for whites in table 5 and for nonwhites in table 6. In order to find the position of any city in these tables, reference to table 10, which gives its size-of-city group and rank, will be found helpful.

TABLE 5.—*Mortality from tuberculosis (all forms) in the 92 cities of over 100,000 population grouped according to size of city United States, 1939–41 (white)*[1]

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Rank	City	Rate
	Cities of 100,000 to 200,000			*Cities of 200,000 to 500,000*	
1	Grand Rapids, Mich	15.6	1	Minneapolis, Minn	20.9
2	Charlotte, N C	17.8	2	Akron, Ohio	25.1
3	Salt Lake City, Utah	19.3	3	St Paul, Minn	28.8
4	Des Moines, Iowa	22.7	4	Rochester, N Y	31.5
5	Spokane, Wash	23.8	5	Portland, Oreg	31.9
6	Duluth, Minn	25.1	6	Syracuse, N Y	32.0
7	Flint, Mich	25.5	7	Atlanta, Ga	32.5
8	Wichita, Kans	26.4	8	Birmingham, Ala	34.7
9	Long Beach, Calif	26.6	9	Louisville, Ky	34.8
10	Peoria, Ill	27.0	10	Omaha, Nebr	34.9
11	Springfield, Mass	27.2	11	Kansas City, Mo	36.5
12	Somerville, Mass	27.7	12	Indianapolis, Ind	37.6
13	Jacksonville, Fla	28.8	13	Columbus, Ohio	38.2
14	Miami, Fla	28.9	14	Oklahoma City, Okla	39.0
15	Kansas City, Kans	29.9	15	Providence, R I	39.5
16	Utica, N Y	30.8	16	Memphis, Tenn	39.7
17	Paterson, N J	32.2	17	Newark, N J	39.9
18	New Haven, Conn	33.0	18	Oakland, Calif	40.5
19	Norfolk, Va	33.9	19	Cincinnati, Ohio	42.7
20	Tampa, Fla	34.5	20	Dallas, Tex	45.3
21	Lowell, Mass	35.2	21	San Diego, Calif	46.9
22	Worcester, Mass	35.6	22	Seattle, Wash	48.8
23	Richmond, Va	35.9	23	New Orleans, La	54.6
24	Hartford, Conn	36.1	24	Denver, Colo	54.7
25	Wilmington, Del	36.3	25	Jersey City, N J	56.8
26	Erie, Pa	36.5	26	Houston, Texas	56.9
27	South Bend, Ind	36.9	27	Toledo, Ohio	66.1
28	Yonkers, N Y	37.6	28	Dayton, Ohio	67.4
29	Bridgeport, Conn	38.5	29	San Antonio, Tex	151.7
30	Fort Worth, Tex	38.7			
31	Camden, N J	39.1		*Cities of 500,000 to 1,000,000*	
32	Youngstown, Ohio	39.6			
33	Scranton, Pa	39.7	1	St Louis, Mo	37.0
34	Elizabeth, N J	40.0	2	Washington, D C	38.3
35	Tacoma, Wash	40.2	3	Pittsburgh, Pa	38.9
36	Gary, Ind	40.5	4	Milwaukee, Wis	39.3
37	Fort Wayne, Ind	40.5	5	Cleveland, Ohio	42.1
38	Canton, Ohio	40.6	6	Baltimore, Md	46.8
39	Knoxville, Tenn	43.3	7	Buffalo, N Y	48.0
40	Albany, N Y	45.7	8	Boston, Mass	55.0
41	Tulsa, Okla	46.2	9	San Francisco, Calif	61.0
42	Cambridge, Mass	48.4			
43	Nashville, Tenn	50.0		*Cities of 1,000,000 and over*	
44	New Bedford, Mass	50.1			
45	Reading, Pa	50.4	1	Detroit, Mich	36.5
46	Fall River, Mass	50.8	2	New York, N Y	40.4
47	Chattanooga, Tenn	61.8	3	Philadelphia, Pa	44.3
48	Trenton, N J	67.4	4	Chicago, Ill	45.4
49	Sacramento, Calif	97.5	5	Los Angeles, Calif	49.7

[1] For cities having small nonwhite populations, the rate for "all races" is used

RELATIVE POSITION OF CITIES WHEN GROUPED ACCORDING TO GEOGRAPHIC DIVISIONS

In order to observe the variation in tuberculosis rates in communities located in different parts of the country, the cities have been classified into 5 broad geographic divisions, as follows. New England and Atlantic, North Central, South Central, Mountain, and Pacific. Table 7 shows the rate for each of these groups by race, and the percent of its population which is nonwhite. The total tuberculosis rate (all races) is highest in the South Central areas, and lowest in the Mountain cities. The picture of tuberculosis mortality among whites, when considered geographically, is almost a complete reversal of that found

TABLE 6.—*Mortality from tuberculosis (all forms) in 39*[1] *cities of over 100,000 population grouped according to size of city: United States, 1939–41 (nonwhite)*

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Rank	City	Rate
	Cities of 100,000 to 200,000			*Cities of 200,000 to 500,000*—Con.	
1	Fort Worth, Tex	102 7	7	Indianapolis, Ind	167.9
2	Charlotte, N. C	107 2	8	Kansas City, Mo	179.3
3	Kansas City, Kans.	109 2	9	Columbus, Ohio	187.5
4	Richmond, Va	135.3	10	Atlanta, Ga	188.3
5	Wilmington, Del	148.9	11	Cincinnati, Ohio	243 3
6	Tampa, Fla	151 3	12	Newark, N. J	275.5
7	Nashville, Tenn	153 5			
8	Camden, N J	159 5		*Cities of 500,000 to 1,000,000*	
9	Miami, Fla	162.3			
10	Knoxville, Tenn	173 9	1	St Louis, Mo	176.0
11	Norfolk, Va	180.1	2	Pittsburgh, Pa	182.6
12	Gary, Ind	180 7	3	San Francisco, Calif	188 5
13	Jacksonville, Fla	198.4	4	Washington, D. C	194.3
14	Tulsa, Okla	234.1	5	Boston, Mass	215 7
15	Chattanooga, Tenn	244.4	6	Baltimore, Md	229.2
			7	Cleveland, Ohio	235.1
	Cities of 200,000 to 500,000				
				Cities of 1,000,000 and over	
1	Dallas, Tex	116 9			
2	Houston, Tex	134 4	1	Los Angeles, Calif	137 3
3	New Orleans, La	141.6	2	Detroit, Mich	189.0
4	Birmingham, Ala	155 1	3	Philadelphia, Pa	203.5
5	Memphis, Tenn	158 8	4	New York, N. Y	213.0
6	Louisville, Ky.	160.3	5	Chicago, Ill	250.1

[1] Cities included in this table are those with more than 20,000 nonwhites, or more than 10 percent nonwhite population.

TABLE 7.—*Mortality from tuberculosis (all forms) among residents of cities of over 100,000 population classified by broad geographic divisions and by race: United States, 1939–41*

Geographic division	Number of cities	Average annual tuberculosis death rate	Population 1940	Number of deaths from tuberculosis, 1939–41	Percent nonwhite population	Percent nonwhite deaths
ALL RACES						
All cities	92	55 4	37,987,989	63,086	8.7	30.0
New England and Atlantic	40	55.2	18,339,844	30,395	8 8	31.9
North Central	27	51 2	12,117,519	18,630	7.0	29.1
South Central	13	77 3	3,238,629	7,512	21.8	43.0
Mountain	2	43 4	472,346	616		
Pacific	10	51.8	3,819,651	5,933	3.4	9.8
All cities	92	42.4	34,687,522	44,155		
New England and Atlantic	40	41.2	16,728,008	20,701		
North Central	27	39 1	11,264,061	13,209		
South Central	13	56.3	2,533,138	4,279		
Mountain	2	43.4	472,346	616		
Pacific	10	48.3	3,689,969	5,350		
NONWHITE						
All cities	39	191.2	3,300,467	18,931		
New England and Atlantic	16	200 5	1,611,836	9,694		
North Central	10	211.7	853,458	5,421		
South Central	11	152.8	705,491	3,233		
Mountain						
Pacific	2	149 6	129,682	583		

among nonwhites The rates are most favorable to the whites in the sections which in general comprise the Northeast (North Central and New England and Atlantic) and are highest in the Southwest (South Central and Pacific) The nonwhite rates, on the other hand, are at a minimum in the Southwest and are highest in the Northeast

The ranking of the individual cities within their geographic divisions is presented for whites in table 8 and for nonwhites in table 9

TABLE 8 —*Mortality from tuberculosis (all forms) in the 92 cities of over 100,000 population grouped by broad geographic divisions United States, 1939–41 (white)*[1]

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate
	New England and Atlantic cities	
1	Charlotte N C	17 8
2	Springfield Mass	27 2
3	Somerville Mass	27 [illegible]
4	Jacksonville, Fla	28 8
5	Miami Fla	28 9
6	Utica N Y	30 [illegible]
7	Rochester N Y	31 5
8	Syracuse N Y	32 0
9	Paterson N J	32 2
10	Atlanta, Ga	32 5
11	New Haven Conn	33 0
12	Norfolk Va	33 9
13	Tampa Fla	34 5
14	Lowell, Mass	35 2
15	Worcester Mass	35 6
16	Richmond Va	35 9
17	Hartford Conn	36 1
18	Wilmington Del	36 3
19	Erie Pa	36 5
20	Yonkers N Y	37 6
21	Washington D C	38 3
22	Bridgeport Conn	38 5
23	Pittsburgh Pa	38 9
24	Camden N J	39 1
25	Providence R I	39 5
26	Scranton Pa	39 7
27	Newark N J	39 9
28	Elizabeth N J	40 0
29	New York N Y	40 4
30	Philadelphia Pa	44 3
31	Albany N Y	45 7
32	Baltimore Md	46 8
33	Buffalo N Y	48 0
34	Cambridge Mass	48 4
35	New Bedford, Mass	50 1
36	Reading Pa	50 4
37	Fall River Mass	50 8
38	Boston Mass	55 0
39	Jersey City N J	56 8
40	Trenton N J	67 4
	North Central cities	
1	Grand Rapids Mich	15 6
2	Minneapolis Minn	20 9
3	Des Moines Iowa	22 7
4	Akron Ohio	25 1
5	Duluth Minn	25 1
6	Flint Mich	25 5
7	Wichita Kans	26 4
8	St Paul Minn	26 8
9	Peoria Ill	27 0
	North Central cities—Continued	
10	Kansas City, Kans	29 9
11	Omaha Nebr	34 9
12	Detroit Mich	36 5
13	Kansas City Mo	36 5
14	South Bend Ind	36 9
15	St Louis Mo	37 0
16	Indianapolis, Ind	37 6
17	Columbus Ohio	38 2
18	Milwaukee Wis	39 3
19	Youngstown Ohio	39 6
20	Fort Wayne Ind	40 5
21	Gary Ind	40 5
22	Canton Ohio	40 6
23	Cleveland, Ohio	42 1
24	Cincinnati Ohio	42 7
25	Chicago Ill	45 4
26	Toledo Ohio	66 1
27	Dayton, Ohio	67 4
	South Central cities	
1	Birmingham Ala	34 7
2	Louisville Ky	34 8
3	Fort Worth, Tex	38 7
4	Oklahoma City Okla	39 0
5	Memphis Tenn	39 7
6	Knoxville Tenn	43 3
7	Dallas Tex	45 3
8	Tulsa Okla	46 2
9	Nashville Tenn	50 0
10	New Orleans La	54 6
11	Houston Tex	56 9
12	Chattanooga Tenn	61 8
13	San Antonio, Tex	151 7
	Mountain cities	
1	Salt Lake City Utah	19 3
2	Denver Colo	54 7
	Pacific cities	
1	Spokane Wash	23 8
2	Long Beach Calif	26 6
3	Portland Oreg	31 9
4	Tacoma, Wash	40 2
5	Oakland Calif	40 5
6	San Diego Calif	46 9
7	Seattle Wash	48 8
8	Los Angeles Calif	55 6
9	San Francisco Calif	61 0
10	Sacramento, Calif	97 5

[1] For cities having small nonwhite populations, the rate for "all races" is used

TABLE 9.—*Mortality from tuberculosis (all forms) in 39*[1] *cities of over 100,000 population grouped by broad geographic divisions United States, 1939–41 (nonwhite)*

[Cities are ranked according to tuberculosis death rate]

Rank	City	Rate	Rank	City	Rate
	New England and Atlantic cities			*North Central cities*—Continued	
1	Charlotte N C	107 2	6	Columbus, Ohio	187 5
2	Richmond, Va	135 3	7	Detroit, Mich	189 0
3	Wilmington, Del	148 9	8	Cleveland, Ohio	235 1
4	Tampa, Fla	151 3	9	Cincinnati, Ohio	243 3
5	Camden, N J	159 5	10	Chicago, Ill	250 1
6	Miami Fla	162 3		*South Central cities*	
7	Norfolk, Va	180 1			
8	Pittsburgh, Pa	182 6			
9	Atlanta Ga	188 3	1	Fort Worth, Tex	102 7
10	Washington, D C	194 3	2	Dallas, Tex	116 9
11	Jacksonville, Fla	198 4	3	Houston, Tex	134 4
12	Philadelphia, Pa	203 5	4	New Orleans, La	141 6
13	New York, N Y	213 0	5	Nashville, Tenn	153 5
14	Boston, Mass	215 7	6	Birmingham, Ala	155 1
15	Baltimore, Md	229 2	7	Memphis, Tenn	158 8
16	Newark, N J	275 5	8	Louisville, Ky	160 3
			9	Knoxville, Tenn	173 9
	North Central cities		10	Tulsa, Okla	234 1
			11	Chattanooga, Tenn	244 4
1	Kansas City, Kans	109 2		*Pacific cities*	
2	Indianapolis Ind	167 9			
3	St Louis Mo	176 0			
4	Kansas City, Mo	179 3	1	Los Angeles, Calif	137 3
5	Gary, Ind	180 7	2	San Francisco, Calif	188 5

[1] Cities included in this table are those with more than 20 000 nonwhites, or more than 10 percent non white population

Appendix

TABLE 10.—*Alphabetical listing of the 92 cities of 100,000 or more population with their respective ranking numbers as found in tables 1 through 9*

No	City	Population size group	Geographic division	Rank among 92 cities			Rank within its population size group		Rank within its geographic division	
				All races	White	Non-white	White	Non white	White	Non-white
1	Akron, Ohio	200 000-500 000	North Central	6	7		2		4	
2	Albany, N Y	100,000-200 000	Northeastern and Atlantic	41	69		40		31	
3	Atlanta, Ga	200 000-500 000	Northeastern and Atlantic	87	24	25	7	10	10	9
4	Baltimore, Md	500 000-1 000 000	Northeastern and Atlantic	84	71	33	6	6	32	15
5	Birmingham, Ala	200 000-500 000	South Central	86	28	12	8	4	1	6
6	Boston, Mass	500 000-1 000 000	Northeastern and Atlantic	66	83	32	8	5	38	14
7	Bridgeport, Conn	100 000-200 000	Northeastern and Atlantic	28	45		29		22	
8	Buffalo, N Y	500 000-1 000 000	Northeastern and Atlantic	44	73		7		33	
9	Cambridge, Mass	100 000-200 000	Northeastern and Atlantic	45	74		42		34	
10	Camden N J	100 000-200 000	Northeastern and Atlantic	54	49	14	31	8	24	5
11	Canton, Ohio	100 000-200 000	North Central	38	62		38		22	
12	Charlotte N C	100 000-200 000	Northeastern and Atlantic	40	2	2	2	2	1	1
13	Chattanooga, Tenn	100 000-200 000	South Central	91	87	3[illegible]	47	15	12	11
14	Chicago, Ill	1 000 000 and over	North Central	69	68	38	4	5	25	10
15	Cincinnati, Ohio	200 000-500 000	North Central	75	64	36	19	11	24	9
16	Cleveland, Ohio	500 000-1 000 000	North Central	67	63	35	5	7	23	8
17	Columbus, Ohio	200 000-500 000	North Central	61	43	24	13	9	17	6
18	Dallas, Tex	200 000-500 000	South Central	64	67	4	20	1	7	2
19	Dayton Ohio	200 000-500 000	North Central	78	89		28		27	
20	Denver Colo	200 000-500 000	Mountain	57	82		24		2	
21	Des Moines Iowa	100 000-200 000	North Central	4	5		4		3	
22	Detroit, Mich	1 000 000 and over	North Central	50	36	27	1	2	12	7
23	Duluth, Minn	100 000-200 000	North Central	7	8		6		5	
24	Elizabeth, N J	100 000-200 000	Northeastern and Atlantic	34	56		34		28	
25	Erie Pa	100 000-200 000	Northeastern and Atlantic	25	37		26		19	
26	Fall River Mass	100 000-200 000	Northeas ern and Atlantic	51	80		46		37	
27	Flint, Mich	100 000-200 000	North Central	8	9		7		6	
28	Fort Wayne Ind	100 000-200 000	North Central	37	60		37		20	
29	Fort Worth, Tex	100 000-200 000	South Central	43	46	1	30	1	3	1
30	Gafy Ind	100 000-200 000	North Central	73	59	22	36	12	21	5
31	Grand Rapids Mich	100 000-200 000	North Central	1	1		1		1	
32	Hartford, Conn	100 000-200 000	Northeastern and Atlantic	24	34		24		17	
33	Houston Tex	200 000-500 000	South Central	80	85	5	26	2	11	3
34	Indianapolis, Ind	200 000-500 000	North Central	58	42	17	12	7	16	2
35	Jacksonville Fla	100 000-200 000	Northeastern and Atlantic	89	16	29	13	13	4	11
36	Jersey City, N J	200 000-500 000	Northeastern and Atlantic	62	84		25		39	
37	Kansas City, Kans	100 000-200 000	North Central	39	18	3	15	3	10	1
38	Kansas City, Mo	200 000-500 000	North Central	52	38	20	11	8	13	4

TABLE 10.—*Alphabetical listing of the 92 cities of 100,000 or more population with their respective ranking numbers as found in tables 1 through 9*—Continued

No	City	Population size group	Geographic division	Rank among 92 cities			Rank within its population size group		Rank within its geographic division	
				All races	White	Non white	White	Non white	White	Non-white
39	Knoxville Tenn	100 000–200 000	South Central	68	65	18	39	10	6	9
40	Long Beach, Calif	100 000–200 000	Pacific	10	11		9		2	
41	Los Angeles, Calif	1 000 000 and over	Pacific	59	76	7	5	1	8	1
42	Louisville Ky	200 000–500 000	South Central	56	29	15	9	6	2	8
43	Lowell, Mass	100 000–200 000	Northeastern and Atlantic	22	31		21		14	
44	Memphis, Tenn	200 000–500 000	South Central	88	53	13	16	5	5	7
45	Miami, Fla	100 000–200 000	Northeastern and Atlantic	63	17	16	14	9	5	6
46	Milwaukee, Wis	500 000–1 000 000	North Central	30	50		4		18	
47	Minneapolis, Minn	200 000–500 000	North Central	3	4		1		2	
48	Nashville, Tenn	100 000–200 000	South Central	81	77	11	43	7	9	5
49	Newark, N J	200 000–500 000	Northeastern and Atlantic	71	55	39	17	12	27	16
50	New Bedford, Mass	100 000–200 000	Northeastern and Atlantic	47	78		44		35	
51	New Haven, Conn	100 000–200 000	Northeastern and Atlantic	20	25		18		11	
52	New Orleans La	200 000–500 000	South Central	83	81	8	23	3	10	4
53	New York, N Y	1 000 000 and over	Northeastern and Atlantic	53	58	31	2	4	29	13
54	Norfolk, Va	100 000–200 000	Northeastern and Atlantic	82	26	21	19	11	12	7
55	Oakland, Calif	200 000–500 000	Pacific	36	61		18		5	
56	Oklahoma City, Okla	200 000–500 000	South Central	29	48		14		4	
57	Omaha, Nebr	200 000–500 000	North Central	21	30		10		11	
58	Paterson N J	100 000–200 000	Northeastern and Atlantic	19	23		17		9	
59	Peoria, Ill	100 000–200 000	North Central	12	13		10		9	
60	Philadelphia, Pa	1 000 000 and over	Northeastern and Atlantic	70	66	30	3	3	30	12
61	Pittsburgh Pa	500 000–1 000 000	Northeastern and Atlantic	55	47	23	3	2	23	8
62	Portland, Oreg	200 000–500 000	Pacific	17	21		5		3	
63	Providence R I	200 000–500 000	Northeastern and Atlantic	31	51		15		25	
64	Reading Pa	100 000–200 000	Northeastern and Atlantic	48	79		45		36	
65	Richmond Va	100 000–200 000	Northeastern and Atlantic	79	33	6	23	4	16	2
66	Rochester, N Y	200 000–500 000	Northeastern and Atlantic	16	20		4		7	
67	Sacramento, Calif	100 000–200 000	Pacific	90	91		49		10	
68	St Louis Mo	500 000–1 000 000	North Central	60	40	19	1	1	15	3
69	St Paul Minn	200 000–500 000	North Central	11	12		3		8	
70	Salt Lake City Utah	100 000–200 000	Mountain	2	3		3		1	
71	San Antonio Tex	200 000–500 000	South Central	92	92		29		13	
72	San Diego Calif	200 000–500 000	Pacific	42	72		21		6	
73	San Francisco, Calif	500 000 1 000 000	Pacific	76	86	26	9	3	9	2
74	Scranton Pa	100 000–200 000	Northeastern and Atlantic	33	54		33		26	
75	Seattle Wash	200 000–500 000	Pacific	46	75		22		7	-
76	Somerville, Mass	100 000–200 000	Northeastern and Atlantic	14	15		12		3	
77	South Bend, Ind	100 000–200 000	North Central	26	39		27		14	

78	Spokane, Wash	100,000-200,000	Pacific	5	6	--------	5	--------	1	--------
79	Springfield, Mass	100,000-200,000	Northeastern and Atlantic	13	14	--------	11	--------	2	--------
80	Syracuse, N. Y	200,000-500,000	Northeastern and Atlantic	18	22	--------	6	--------	8	--------
81	Tacoma, Wash	100,000-200,000	Pacific	35	57	--------	35	--------	4	--------
82	Tampa, Fla	100,000-200,000	Northeastern and Atlantic	65	27	10	20	6	13	4
83	Toledo, Ohio	200,000-500,000	North Central	72	88	--------	27	--------	28	--------
84	Trenton, N. J	100,000-200,000	Northeastern and Atlantic	77	90	--------	48	--------	40	--------
85	Tulsa, Okla	100,000-200,000	South Central	74	70	34	41	14	8	10
86	Utica, N. Y	100,000-200,000	Northeastern and Atlantic	15	19	--------	16	--------	6	--------
87	Washington, D. C	500,000-1,000,000	Northeastern and Atlantic	85	44	28	2	4	21	10
88	Wichita, Kans	100,000-200,000	North Central	9	10	--------	8	--------	7	--------
89	Wilmington, Del	100,000-200,000	Northeastern and Atlantic	49	35	9	25	5	18	3
90	Worcester, Mass	100,000-200,000	Northeastern and Atlantic	23	32	--------	22	--------	15	--------
91	Yonkers, N. Y	100,000-200,000	Northeastern and Atlantic	27	41	--------	28	--------	20	--------
92	Youngstown, Ohio	100,000-200,000	North Central	32	52	--------	32	--------	19	--------

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 15, 1944

Summary

Of a total of 462 cases of poliomyelitis reported for the week ended June 15, 400 cases, or 87 percent, were reported in the South Atlantic, Middle Atlantic, East South Central, and East North Central areas (listed in decreasing order of reported cases). Of the increase over last week's total of 290 cases, 90 percent occurred in the Middle Atlantic, East South Central, and East North Central States, principally in New York, Kentucky, and Virginia. Thirteen States reporting 10 or more cases each, all except North Carolina showing increases (last week's figures in parentheses), are as follows: New York 93 (34), Pennsylvania 31 (26), Ohio 16 (7), Indiana 13 (6), Illinois 16 (6), Michigan 10 (1), Virginia 39 (14), North Carolina 63 (94), Kentucky 66 (28), Mississippi 10 (2), Louisiana 11 (9), Texas 13 (5), California 12 (8).

The largest number of cases previously reported for the country as a whole for any corresponding week for which comparable records are available (since 1927) was 297 cases for the same week last year. Prior to June 24, 1944, the weekly cumulative incidence was continuously below that of 1943. For the 3 weeks since that date, 974 cases have been reported, as compared with 732 for the corresponding 3 weeks last year. The total to date this year is 1,756 cases, as compared with 1,626 for the same period last year.

A total of 205 cases of meningococcus meningitis was reported, as compared with 188 for the preceding week, a 5-year median of 35, and 264 for the corresponding week last year. States reporting the largest numbers are New York 25, Pennsylvania and Illinois 15 each, California 17, and Missouri and Virginia 10 each. The cumulative total to date is 12,232, as compared with 12,542 for the same period last year and a 5-year median of 1,276.

Of a total of 148 cases of typhoid fever, as compared with 207 for the week last year and a 5-year median of 239, 17 occurred in Louisiana, 14 in Texas, 8 in Alabama, and 7 each in New York, Indiana, North Carolina, and Kentucky. The total to date is 2,401, as compared with 2,160 for the period last year and a 5-year median of 2,969.

Deaths registered for the week in 93 large cities of the United States totaled 8,845, as compared with 7,838 last week and a 3-year (1941–43) average of 7,849. The total to date is 264,129, as compared with 269,954 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended July 15, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended July 15, 1944	Diphtheria: Week ended July 17, 1943	Diphtheria: Median 1939-43	Influenza: Week ended July 15, 1944	Influenza: Week ended July 17, 1943	Influenza: Median 1939-43	Measles: Week ended July 15, 1944	Measles: Week ended July 17, 1943	Measles: Median 1939-43	Meningitis, meningococcus: Week ended July 15, 1944	Meningitis, meningococcus: Week ended July 17, 1943	Meningitis, meningococcus: Median 1939-43
NEW ENGLAND												
Maine	0	1	1	1			14	87	87	1	4	0
New Hampshire	0	0	0				2	4	4	0	0	0
Vermont	0	1	0	--			11	37	47	0	0	0
Massachusetts	5	1	3			-	227	328	410	8	20	2
Rhode Island	0	0	1	7			7	38	41	1	1	0
Connecticut	1	1	0	2	1	1	52	66	75	2	5	0
MIDDLE ATLANTIC												
New York	7	6	14	(1)	[1] 4	[1] 3	485	951	840	25	33	8
New Jersey	3	3	6		1	1	167	760	500	9	8	2
Pennsylvania	9	10	10				111	211	211	15	21	4
EAST NORTH CENTRAL												
Ohio	5	7	6	2	2	6	38	154	77	7	17	1
Indiana	3	2	2	13	4	4	4	49	16	4	2	1
Illinois	6	7	14	-	6	6	60	342	228	15	10	1
Michigan [2]	7	3	3		2	1	146	653	370	9	8	1
Wisconsin	2	7	1	3	10	10	235	593	593	8	4	1
WEST NORTH CENTRAL												
Minnesota	1	1	1		1	1	52	180	29	2	3	0
Iowa	2	1	1			1	14	39	45	2	6	0
Missouri	2	1	1				14	37	31	10	8	1
North Dakota	4	3	2	1			2	82	9	0	3	0
South Dakota	0	2	1	-			33	24	8	0	0	0
Nebraska	1	1	1	3			14	12	12	8	0	0
Kansas	1	2	2				27	55	53	1	4	1
SOUTH ATLANTIC												
Delaware	0	1	0	-			0	6	1	1	1	0
Maryland [2]	1	1	1			1	31	64	40	7	9	1
District of Columbia	0	1	2				24	33	33	2	2	0
Virginia	0	1	4	44	42	36	57	74	74	10	8	2
West Virginia	0	3	2			2	19	27	23	3	1	1
North Carolina	4	12	4	1	5		69	61	61	[3] 4	10	1
South Carolina	1	0	6	68	121	105	33	10	8	4	7	1
Georgia	5	3	3	4	16	16	4	23	20	0	4	0
Florida	7	4	2		18	7	41	13	16	[3] 3	5	1
EAST SOUTH CENTRAL												
Kentucky	1	6	1		3	--	16	10	10	4	6	3
Tennessee	3	5	2	8	4	12	11	38	25	2	2	1
Alabama	5	5	5	5	7	7	6	30	30	5	2	2
Mississippi [2]	4	2	3							4	5	1
WEST SOUTH CENTRAL												
Arkansas	4	3	3	18	10	2	38	11	16	2	1	1
Louisiana	2	3	3	2	9	9	9	11	11	3	3	1
Oklahoma	1	5	3	5	7	7	15	10	10	0	0	0
Texas	24	23	13	203	300	106	237	118	85	4	11	1
MOUNTAIN												
Montana	1	0	0	--			4	45	29	1	0	0
Idaho	0	0	1	-			2	3	3	1	0	0
Wyoming	0	0	0	-	4		9	17	17	0	2	0
Colorado	4	4	4	4			27	33	32	3	0	0
New Mexico	0	0	0	-	1	-	4	2	4	0	0	0
Arizona	8	8	0	16	42	24	9	15	37	0	1	0
Utah [2]	0	0	0	1			21	20	24	0	2	0
Nevada	0	0	0	-	--	-	5	26	5	0	0	0
PACIFIC												
Washington	0	8	0	1	-	-	49	74	74	2	8	0
Oregon	0	10	2	2	4	6	36	58	43	1	4	0
California	22	19	12	7	19	19	641	324	324	17	13	
Total	151	182	152	421	643	459	3,132	5,858	4,840	205	264	85
28 weeks	5,844	6,446	6,826	336,447	78,898	150,230	583,980	528,593	458,652	12,282	12,542	1,276

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Corrected reports.—Meningococcus meningitis: Week ended June 24—North Carolina 8 cases, Florida 4 cases; week ended July 1—Florida 3 cases.

Telegraphic morbidity reports from State health officers for the week ended July 15, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [6]		
	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43
	July 15, 1944	July 17, 1943		July 15, 1944	July 17, 1943		July 15, 1944	July 17, 1943		July 15, 1944	July 17, 1943	
NEW ENGLAND												
Maine	1	2	0	10	9	3	0	0	0	0	1	1
New Hampshire	3	0	0	0	3	1	0	0	0	0	0	0
Vermont	0	0	0	3	0	2	0	0	0	0	0	0
Massachusetts	2	0	0	84	92	66	0	0	0	3	5	3
Rhode Island	0	1	0	2	5	2	0	0	0	0	1	1
Connecticut	2	3	0	12	21	13	0	0	0	0	0	3
MIDDLE ATLANTIC												
New York	93	11	3	116	89	103	0	0	0	7	6	8
New Jersey	1	0	0	36	22	31	0	0	0	2	2	2
Pennsylvania	31	3	0	73	44	92	0	0	0	5	9	9
EAST NORTH CENTRAL												
Ohio	16	0	3	64	57	57	1	0	0	3	12	9
Indiana	13	0	1	14	17	17	0	0	1	7	7	7
Illinois	16	2	5	49	53	71	0	0	1	2	5	9
Michigan [2]	10	2	4	46	33	74	2	0	1	4	5	5
Wisconsin	3	0	0	31	43	42	0	0	0	1	3	1
WEST NORTH CENTRAL												
Minnesota	1	2	2	17	16	20	0	0	0	1	0	0
Iowa	2	2	2	9	10	10	0	0	2	2	1	1
Missouri	1	4	1	6	11	11	0	0	0	4	7	6
North Dakota	1	0	0	5	2	2	0	0	0	0	0	1
South Dakota	0	0	0	7	5	4	0	0	4	0	0	0
Nebraska	0	0	0	3	2	5	0	0	1	0	1	0
Kansas	3	7	1	13	14	19	0	0	0	1	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	1	1	3	0	0	0	0	0	0
Maryland [2]	0	1	0	30	17	14	0	0	0	3	0	4
District of Columbia	0	0	0	12	4	4	0	0	0	2	2	1
Virginia	39	1	1	5	11	10	0	0	0	6	6	8
West Virginia	3	0	0	15	3	12	0	0	0	2	8	8
North Carolina	[4] 63	1	1	17	22	9	0	0	0	7	5	7
South Carolina	5	0	3	2	2	2	0	0	0	6	8	10
Georgia	9	1	2	7	0	1	0	0	0	6	8	19
Florida	7	2	2	3	1	2	0	0	0	4	2	4
EAST SOUTH CENTRAL												
Kentucky	66	0	3	7	7	14	0	0	0	7	11	11
Tennessee	7	0	2	12	17	15	0	0	0	6	14	14
Alabama	8	3	3	2	8	10	0	0	0	8	7	7
Mississippi [2]	10	2	0	2	3	2	0	0	0	1	8	8
WEST SOUTH CENTRAL												
Arkansas	1	7	2	1	6	3	0	0	0	6	15	14
Louisiana	11	0	1	3	4	5	0	0	0	17	5	12
Oklahoma	1	39	1	1	3	5	1	0	0	3	10	10
Texas	13	102	7	25	26	14	0	0	0	14	25	27
MOUNTAIN												
Montana	0	0	0	7	8	8	0	0	0	0	0	0
Idaho	0	0	0	6	2	2	0	0	0	0	1	1
Wyoming	0	0	0	4	15	5	0	0	0	0	1	0
Colorado	2	1	0	21	25	9	0	0	0	0	0	2
New Mexico	0	1	1	12	3	3	0	0	0	3	0	1
Arizona	0	3	0	3	9	1	0	0	0	0	1	2
Utah [2]	0	2	1	7	7	4	0	0	0	0	0	0
Nevada	0	2	0	1	1	0	0	0	0	0	0	0
PACIFIC												
Washington	2	0	0	41	13	13	1	1	1	0	0	2
Oregon	4	0	0	14	11	5	0	0	1	1	0	0
California	13	90	27	114	69	58	0	0	0	4	3	4
Total	462	297	143	975	846	884	5	1	16	148	207	239
28 weeks	[4] 1,756	1,626	974	143,757	93,978	93,978	278	584	1,146	2,401	2,160	2,969

[2] Period ended earlier than Saturday.
[4] Corrected report. Week ended June 24: Poliomyelitis, North Carolina, 41 cases.
[6] Including paratyphoid fever cases reported separately, as follows: Massachusetts, 2, New York 1, Michigan 1, South Carolina 1, Georgia 3, Florida 1, Kentucky 1, Arkansas 2, Louisiana 1, Texas 2, California 3.

Telegraphic morbidity reports from State health officers for the week ended July 15, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended July 15, 1944	Whooping cough: Week ended July 17, 1943	Whooping cough: Median 1939-43	Week ended July 15, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	30	20	21	0	0	0	0	0	9	0	0	0
New Hampshire	0	7	1	0	0	0	0	0	0	0	0	0
Vermont	51	9	16	0	0	0	0	0	0	0	0	0
Massachusetts	73	75	116	0	0	0	0	0	0	0	0	1
Rhode Island	5	19	12	0	0	0	0	0	0	0	0	0
Connecticut	49	16	53	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	136	236	301	0	4	9	0	0	0	1	0	0
New Jersey	65	221	221	0	0	0	0	0	0	2	0	0
Pennsylvania	90	265	203	0	1	0	0	0	0	1	0	0
EAST NORTH CENTRAL												
Ohio	136	223	267	0	0	0	0	0	0	0	0	0
Indiana	21	68	51	0	0	0	0	0	0	4	1	0
Illinois	88	207	207	0	1	0	0	2	0	0	0	0
Michigan [2]	90	250	250	0	0	3	0	1	0	0	0	0
Wisconsin	88	262	208	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	20	64	64	0	1	0	0	0	0	0	0	0
Iowa	7	53	44	0	0	0	0	0	0		0	0
Missouri	29	53	36	0	0	0	0	0	0	0	0	0
North Dakota	16	25	20	0	0	0	0	3	0	0	1	0
South Dakota	22	12	3	0	0	0	0	0	0	0	0	0
Nebraska	27	24	24	0	0	0	0	0	0	0	0	0
Kansas	48	92	63	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	2	7	0	0	0	0	0	0	0	0	0
Maryland [2]	98	102	65	0	0	0	1	0	0	6	0	0
District of Columbia	5	32	15	0	0	0	0	0	0	0	0	0
Virginia	50	148	58	0	1	0	331	0	0	6	2	0
West Virginia	10	109	38	0	0	0	0	0	0	2	0	0
North Carolina	213	226	226	0	0	3	0	0	0	[6] 1	0	[6] 3
South Carolina	88	101	42	0	3	122	0	0	0	0	0	1
Georgia	15	79	34	0	0	9	0	0	0	2	0	33
Florida	31	13	13	0	2	0	0	0	0	0	0	24
EAST SOUTH CENTRAL												
Kentucky	17	25	64	0	0	2	0	0	0	0	0	0
Tennessee	37	55	55	0	0	0	12	0	0	1	2	0
Alabama	31	96	26	0	1	0	0	1	0	3	0	16
Mississippi [2]				0	0	0	0	0	0	0	2	3
WEST SOUTH CENTRAL												
Arkansas	20	25	25	0	0	31	0	0	0	0	5	0
Louisiana	0	5	27	0	1	5	0	0	0	0	0	8
Oklahoma	12	28	19	0	0	0	0	0	0	0	0	0
Texas	253	411	203	0	7	797	0	4	0	0	0	51
MOUNTAIN												
Montana	5	25	10	0	0	0	0	0	0	0	0	0
Idaho	4	0	14	0	0	0	0	0	0	1	0	0
Wyoming	4	0	4	0	0	0	0	0	0	0	0	0
Colorado	23	35	38	0	0	0	0	0	0	0	0	1
New Mexico	2	10	18	0	0	1	0	0	0	0	0	0
Arizona	14	30	14	0	0	0	14	0	0	0	0	0
Utah [2]	60	95	79	0	0	0	0	0	0	1	2	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	17	83	65	0	0	0	0	0	0	0	0	0
Oregon	9	54	27	0	0	0	0	0	0	1	0	0
California	94	195	195	0	3	19	0	0	0	0	0	0
Total	2,203	4,185	4,078	0	25	1,001	358	11	0	32	15	141
Same week 1943	4,185			2	53	599	437	17	1	19	19	123
Same week 1942	3,699			6	17	356	411	13	0	17	27	58
28 weeks 1944	51,879			23	851	10,633	3,670	308	15	[6] 237	330	[6] 1,643
28 weeks 1943	113,876			37	1,048	7,509	2,612	323	16	221	518	1,507
28 weeks 1942	105,735		[7] 109,334	50	550	4,039	2,668	246	32	[7] 244	553	[7] 997

[2] Period ended earlier than Saturday.

[6] Corrected reports.—Week ended June 24: Rocky Mountain spotted fever, North Carolina, 8 cases; typhus fever, North Carolina, 1 case; Florida, 5 cases.

[7] Five-year median, 1939-43.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 1, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	6	0	1	0	0	0	0	0
New Hampshire:												
Concord	0	0	------	0	7	0	0	0	0	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	0	0	------	0	85	4	3	0	40	0	0	3
Fall River	0	0	------	0	4	0	0	0	1	0	0	0
Springfield	0	0	------	0	11	0	0	0	7	0	0	8
Worcester	0	0	------	0	0	0	4	0	15	0	0	4
Rhode Island:												
Providence	0	0	------	0	20	0	1	0	1	0	0	10
Connecticut:												
Bridgeport	0	0	----	0	0	1	0	0	0	0	0	1
New Haven	0	0	------	0	12	1	1	0	1	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	---	0	6	1	1	6	6	0	0	0
New York	6	0	3	1	116	18	44	0	99	0	2	55
Rochester	0	0	------	0	71	0	2	0	6	0	0	3
Syracuse	0	0	------	0	1	1	0	1	2	0	0	3
New Jersey:												
Camden	0	0	------	0	3	1	0	0	2	0	0	0
Newark	0	0	------	0	44	0	0	0	8	0	0	6
Trenton	0	0	------	0	0	0	1	0	0	0	0	1
Pennsylvania:												
Philadelphia	0	0	------	0	25	0	16	0	26	0	1	8
Pittsburgh	0	0	------	0	4	6	8	6	10	0	0	7
Reading	0	0	------	0	1	0	2	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	1	0	5	1	2	1	12	0	1	3
Cleveland	3	0	------	0	3	4	6	1	13	0	1	17
Columbus	0	0	------	0	1	1	0	0	5	0	0	26
Indiana:												
Fort Wayne	0	0	------	0	0	0	2	0	0	0	0	0
Indianapolis	0	0	------	0	13	0	2	0	13	0	0	14
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	1	0	0	0	0	1
Illinois:												
Chicago	1	0	1	2	0	7	12	2	26	0	0	29
Springfield	0	0	------	0	0	0	4	0	0	0	0	0
Michigan:												
Detroit	4	1	------	0	80	3	9	1	18	0	1	64
Flint	0	0	------	0	0	0	1	0	0	0	0	0
Grand Rapids	0	0	------	0	5	0	0	0	3	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	1	0	0	0	0	0	11
Milwaukee	1	0	------	0	103	2	2	0	15	0	1	23
Racine	0	0	------	0	108	0	0	0	1	0	0	2
Superior	0	0	------	0	1	0	0	0	2	0	0	6
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	44	1	0	1	7	0	0	3
Minneapolis	6	1	------	0	6	3	1	1	13	0	0	1
St. Paul	1	0	------	0	4	1	3	1	4	0	0	4
Missouri:												
Kansas City	2	0	------	2	4	1	6	1	3	0	0	6
St. Joseph	0	0	------	0	1	0	0	0	2	0	0	0
St. Louis	0	0	1	0	6	1	12	1	6	0	0	14

City reports for week ended July 1, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	-	0	0	0	0	0	0	0	0	1
Nebraska												
Omaha	0	0		0	9	0	6	0	3	0	0	0
Kansas:												
Topeka	0	0	--	1	8	0	0	2	0	0	0	4
Wichita	0	0	--	0	1	4	0	1	0	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	1	0	0	0	0	0	1
Maryland:												
Baltimore	4	0		0	20	4	4	1	10	0	1	73
Cumberland	0	0		0	0	1	0	0	2	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		0	30	0	1	0	17	0	0	3
Virginia												
Lynchburg	0	0		0	0	0	0	0	1	0	0	1
Richmond	0	0		0	1	1	0	0	2	0	0	0
Roanoke	0	0		0	3	0	0	1	0	0	0	14
West Virginia:												
Wheeling	0	0		0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	3	0	0	0	0	0	0	2
Wilmington	0	0		0	1	0	2	0	0	0	0	11
Winston-Salem	0	0		0	1	0	1	0	0	0	0	2
South Carolina:												
Charleston	1	0		0	0	0	2	1	0	0	0	0
Georgia:												
Atlanta	0	0	1	0	2	0	7	1	2	0	0	1
Brunswick	0	0		0	2	0	0	0	0	0	0	0
Savannah	0	0		0	4	0	2	0	0	0	0	0
Florida:												
Tampa	0	0	1	0	1	0	2	0	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	0	1	6	1	0	0	0	5
Nashville	0	0		0	5	0	1	0	1	0	0	0
Alabama:												
Birmingham	0	0		0	1	0	3	1	0	0	0	0
Mobile	0	0		0	1	0	1	1	0	0	1	1
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0	---	0	0	0	1	0	0	0	0	3
Louisiana												
New Orleans	3	0	2	0	5	1	7	2	1	0	0	0
Shreveport	0	0	---	0	1	0	6	0	1	0	2	0
Texas:												
Dallas	0	0	---	0	10	2	1	0	0	0	0	9
Galveston	0	0	---	0	0	0	3	0	0	0	0	0
Houston	0	0	---	0	3	1	7	1	1	0	1	0
San Antonio	1	0	1	0	0	1	4	0	3	0	0	0
MOUNTAIN												
Montana:												
Billings	1	0	---	0	0	0	1	0	1	0	0	0
Great Falls	0	0	---	0	0	0	1	0	4	0	0	0
Helena	0	0	---	0	0	0	0	0	0	0	0	0
Missoula	1	0	---	0	1	0	1	0	1	0	0	1
Colorado:												
Denver	0	0	---	0	10	0	3	0	8	0	0	9
Pueblo	0	0	---	0	0	0	0	0	0	0	1	0
Utah:												
Salt Lake City	0	0	---	0	21	0	2	0	8	0	0	7

City reports for week ended July 1, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	1	0		0	31	0	7	0	7	0	0	2
Spokane	0	0		0	16	0	0	0	5	0	0	0
Tacoma	0	0		0	14	1	2	0	5	0	0	1
California												
Los Angeles	13	0	1	0	125	1	7	1	30	0	1	8
Sacramento	0	1		0	32	0	5	0	16	0	0	2
San Francisco	0	0		0	116	1	4	0	21	0	0	4
Total	51	3	12	6	1,278	79	247	38	509	0	13	491
Corresponding week, 1943	48		43	17	3,482		332		403	0	22	1,262
Average, 1939-43	54		32	[1] 11	[2] 2,621		[1] 256		513	1	26	1,216

[1] 3-year average, 1941-43
[2] 5-year median

Anthrax—Cases: New York, 1, Camden 1.
Dysentery, amebic—Cases: New York, 1, St. Louis, 1, New Orleans, 1, San Francisco, 1.
Dysentery, bacillary—Cases: Chicago, 1, Detroit, 2, Richmond, 2, Charleston, S. C., 6, Atlanta, 1, Shreveport, 1; Los Angeles, 7.
Dysentery, unspecified—Cases: Baltimore, 2, Shreveport, 2, San Antonio, 21.
Typhus fever, endemic—Cases: New York, 1, Savannah, 1, Tampa, 1, Shreveport, 1, Houston, 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,118,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	0 0	0 0	0 0	0 0	415	17.2	28 6	0 0	186	0 0	0 0	77
Middle Atlantic	2 8	0 0	1 4	0 5	125	12.5	34 3	6 5	74	0 0	1 4	38
East North Central	6 7	0 6	1 2	1 2	194	11 6	24 9	3 0	63	0 0	2 4	116
West North Central	17 9	2 0	2 0	6 0	165	21 9	55.7	15 9	76	0 0	0 0	62
South Atlantic	8 4	0 0	3 3	0 0	114	11 7	35 2	6 7	59	0 0	1 7	181
East South Central	0 0	0 0	0 0	0 0	41	5 9	64 9	17 7	6	0 0	5 9	35
West South Central	11 5	0 0	8 6	0 0	55	14 3	83 2	8 6	17	0 0	8 6	34
Mountain	16 5	0 0	0 0	0 0	264	0 0	66 1	0 0	140	0 0	8 3	140
Pacific	22 1	1 6	1 6	0 0	528	4 7	39 5	1 6	133	0 0	0 0	27
Total	7 8	0 5	1 8	0 9	196	12 1	37 9	5 8	78	0 0	2 0	75

HUMAN CASE OF PNEUMONIC PLAGUE (LABORATORY INFECTION) IN SAN FRANCISCO, CALIF.

A case of primary pneumonic plague, in which the infection was acquired in the laboratory, has been reported in San Francisco, Calif. The case occurred in a Public Health Service officer, who was engaged at the time in plague work at the plague laboratory in San Francisco. The patient became ill on May 30 and was admitted to the United States Marine Hospital on June 1. He is reported to have recovered. Precautionary measures were promptly adopted, and no secondary cases have occurred.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Honolulu—Dengue fever.—For the period June 1–15, 1944, only 2 cases of dengue fever were reported in Honolulu, T. H., bringing the total number of cases reported since the beginning of the outbreak to date to 1,495. These 2 cases represent the lowest semi-monthly incidence of the disease since the beginning of the control program.

DEATHS DURING WEEK ENDED JULY 8, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 8, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	7,835	7,901
Average for 3 prior years	7,919	
Total deaths, first 27 weeks of year	255,281	261,803
Deaths under 1 year of age	516	624
Average for 3 prior years	596	
Deaths under 1 year of age, first 27 weeks of year	16,768	18,304
Data from industrial insurance companies:		
Policies in force	66,653,120	65,598,856
Number of death claims	10,036	10,039
Death claims per 1,000 policies in force, annual rate	7.9	8.0
Death claims per 1,000 policies, first 27 weeks of year, annual rate	10.4	10.2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 17, 1944.—During the week ended June 17, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		25		85	336	62	20	79	138	745
Diphtheria	2	7	1	21	1	13		1		46
German measles		1		60	39		38	18	77	233
Influenza					3	1			2	6
Measles		33	7	439	493	159	53	86	44	1,314
Meningitis, meningococcus					1	2				3
Mumps		3	1	137	144	10	14	97	49	455
Poliomyelitis					3	1			1	5
Scarlet fever		6	2	35	132	25	9	47	72	328
Tuberculosis (all forms)		6	8	289	61	23		9	44	440
Typhoid and paratyphoid fever				6	3					9
Undulant fever				1	1				2	4
Whooping cough		26	1	66	21	3	12	2	30	161

CUBA

Provinces—Notifiable diseases—4 weeks ended June 17, 1944.—During the 4 weeks ended June 17, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		2	3	3		7	15
Cerebrospinal meningitis	1						1
Chickenpox	1	1					2
Diphtheria	2	29	1				32
Leprosy		1		1			2
Malaria	6	5	4	1	2	232	250
Measles	5	15		4			24
Poliomyelitis		6			2		8
Scarlet fever		1					1
Tetanus, infantile			1				1
Tuberculosis	6	30	16	16	3	44	115
Typhoid fever	16	60	11	24	9	30	150
Whooping cough			1				1
Yaws						3	3

[1] Includes the city of Habana.

Plague

French West Africa—Dakar.—For the period June 4–28, 1944, 25 cases of plague with 23 deaths were reported in Dakar, French West Africa.

Palestine—Haifa.—For the week ended July 1, 1944, 1 case of plague was reported in Haifa, Palestine. Several plague-infected rats were also reported for the preceding two weeks.

Smallpox

Bolivia.—For the month of May 1944, 75 cases of smallpox with 20 deaths were reported in Bolivia, including 18 cases of smallpox with 6 deaths reported in La Paz city and 27 cases with 6 deaths reported in Potosi.

Greece—Hevros Department.—For the period March 21–31, 1944, 13 cases of smallpox were reported in Hevros Department, Greece.

Nigeria.—For the week ended June 10, 1944, 105 cases of smallpox with 11 deaths were reported in Nigeria.

Typhus Fever

Greece.—Typhus fever has been reported in Greece as follows: March 1–31, 1944, 57 cases; April 1–30, 1944, 41 cases.

Guatemala.—For the month of May 1944, 198 cases of typhus fever with 47 deaths were reported in Guatemala.

Hungary.—For the 3 weeks ended June 17, 1944, 405 cases of typhus fever (including 190 cases in Subcarpathia) were reported in Hungary.

Irish Free State—Galway County—Oughterard.—For the week ended June 24, 1944, 1 case of typhus fever was reported in Oughterard, Galway County, Irish Free State.

Slovakia.—For the period May 14–June 3, 1944, 28 cases of typhus fever were reported in Slovakia.

Tunisia.—Typhus fever has been reported in Tunisia as follows: June 1–10, 1944, 18 cases; June 11–20, 1944, 38 cases.

Yugoslavia.—For the period April 15 to May 7, 1944, 1,212 cases of typhus fever were reported in Yugoslavia.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Yellow Fever

Belgian Congo—Bondo.—The death from yellow fever in Bondo as published on page 793 of the Public Health Reports of June 16, 1944, occurred on April 29, 1944, and not for the week ended June 3, 1944, as published.

* * *

COURT DECISION ON PUBLIC HEALTH

Venereal disease—examination of persons suspected of being infected.—(Illinois Supreme Court; *People ex rel. Baker et al.* v. *Strautz, Chief of Police,* 54 N.E.2d 441; decided March 21, 1944, rehearing denied May 11, 1944.) In a habeas corpus proceeding in the Supreme Court of Illinois it appeared that the petitioners were arrested in East St. Louis and placed in the city jail. The next morning complaints were filed before a justice of the peace charging that each "wilfully and unlawfully solicited to prostitution" and "wilfully and unlawfully was a lewd and lascivious person in speech and character." The justice of the peace entered an order holding the petitioners for the clinic because it appeared that they might be suffering from a communicable venereal disease. No bond was fixed. The petitioners refused to be medically examined and sought a writ of habeas corpus, first in the city court of East St. Louis and next in the county circuit court, but both courts denied the writ. An original habeas corpus proceeding was then instituted in the State supreme court and the petition was allowed and a return made thereon. Bail was fixed by the court and given by the petitioners and they were thereby released from custody.

The statute under which the petitioners were ordered held for the clinic provided as follows: "When it appears to any judge or justice of the peace from the evidence or otherwise that any person coming before him on any criminal charge may be suffering from any communicable venereal disease, it shall be the duty of such judge or justice of the peace to refer such person to the director of such hospital, sanitarium or clinic, or to such other officer as shall be selected or appointed, for the purpose of examining the accused person, and if such person be found to be suffering from any communicable venereal disease, he or she may by order of the court be sent for treatment to a hospital, sanitarium or clinic if any be available and if necessary to be segregated for such term as the court may impose at such hospital, sanitarium or clinic."

For the purpose of the case the petitioners agreed that the arrests, complaints, and warrants were legal and proper but contended that (1) the above-quoted statute was unconstitutional and void in that (a) it deprived them of their liberty without due process of law, (b) it

contained subjects not expressed in the act's title, (c) it denied them bail when they were not charged with a capital offense, and (d) it denied them the right to be heard in answer to the criminal charges and defend in person and to demand the nature and cause of the accusation and denied them the right to a speedy and public trial; (2) if the said statute was valid, then the order of the justice of the peace was void for the reasons stated under (1); and (3) they had been and were being illegally held in custody in violation of Federal and State constitutional provisions.

The supreme court stated that the power to detain a person suspected of having a contagious disease rested in the police power of the State and that when a State employed its police power to safeguard the public health it could act in a summary manner even though the result was to deprive a citizen of his liberty. That the statute in the instant case was a measure enacted within the State's police power was, according to the court, unquestioned.

After reviewing certain decisions in other jurisdictions the supreme court turned its attention to the provision of the statute relative to a justice of the peace detaining a person suspected of having a venereal disease when it appeared from the evidence "or otherwise" that such person might be suffering from such disease. The statute, said the court, did not mean that the justice had any authority outside of the evidence appearing before him. The power to compel any person arrested on any criminal charge to submit to a medical examination "is limited to a criminal case in which evidence is produced or circumstances develop tending to indicate that the person charged may reasonably be suspected of being afflicted with a communicable venereal disease and must, from its very nature, present sufficient evidence upon which the justice of the peace may issue the order referring the party to some medical officer for such examination." The words authorizing the justice to refer the accused person to "such other officer as shall be selected" meant that the party had to be "sent to some hospital, sanitarium, clinic, or to some recognized medical officer who will properly represent both the accused person and the municipality."

The court said that it could be pointed out that a venereal disease most often exists within the veil of secrecy. "Certainly one who is charged with soliciting to prostitution and one of lewd and lascivious character is one who may first be suspected of carrying such dreadful affliction." It was most reasonable, according to the court, to suspect that the petitioners, if carrying on the practice of prostitution, were indiscriminate and promiscuous in their bodily contacts and were natural subjects and carriers of venereal disease. "* * * it was therefore logical and natural that suspicion immediately be cast upon them and necessity dictate a physical examination of their persons.

The citizens of East St. Louis, the war workers and soldiers in its vicinity are entitled to protection against social diseases. Petitioners furthermore have agreed, for the purpose of this suit, that their arrest was legal and proper, that the complaints later filed and the warrants issued likewise are legal and proper. Such being the case, their detention for examination by the clinic as suspects carrying venereal diseases is likewise reasonable and proper."

The contention that the statute violated the Federal and State constitutions was held by the court not to be supported by authority and the title of the act was held to properly describe the subjects contained in the act. It was also concluded that the statutory provision in question did not violate the criminal code since it was based upon the State's police power and did not fall within the provisions of the criminal code. "This likewise answers the contention that the petitioners were held without bail, since quarantine under the police provisions naturally implies such a detention and demands it."

The petition for discharge under the writ of habeas corpus was denied and the petitioners were remanded to the custody of the chief of police of East St. Louis until they submitted to an examination under the provisions of the statute.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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NATIONAL INVENTORY OF NEEDS FOR SANITATION FACILITIES

IV. RURAL SANITATION

By C. H. ATKINS, *Senior Sanitary Engineer, United States Public Health Service*

INTRODUCTION

A safe water supply and a sanitary method of excreta disposal are essential for every place of habitation, whether it be in a city, village, or rural area. In cities and other urban areas, the density of population usually is such as to make the installation and maintenance of public water supply and sewerage systems economically feasible and these facilities are provided and maintained through organized community effort. Unfortunately this is not true in rural areas and, therefore, in lieu of these needs being met by community effort each householder has the responsibility of providing and maintaining complete water supply and excreta disposal facilities for his home. Thus the development of the necessary personal interest in and the incentive for better rural sanitation requires that primary emphasis be given to educational programs. A higher standard of rural housing, to include the sanitation facilities that may be provided by the individual for his home, will be secured only after he has developed an interest in providing for himself and his family the protection and comfort that can thus be afforded.

Educational programs are essential to create a realization by the rural householder that he has the responsibility for the provision and maintenance of a safe water supply and adequate sanitary facility for his home. Obviously this is a fundamental phase of any environmental sanitation program and should be utilized to the fullest extent in order to advance rural sanitation on a permanent basis. Regulations governing the construction and maintenance of rural sanitary facilities essential for the protection of the public health should be enforced in those instances where educational methods have failed.

Only a few States have adequate public health laws applicable to the control of excreta disposal in rural areas. Legislation governing the construction and maintenance of sanitary facilities where sewers are impracticable should be enacted by the remainder of the States.

This inventory of rural sanitation needs covers the water supply and sewerage facilities not included in Water Supply Needs in States and Sewerage and Water Pollution Abatement, Parts I and III, respectively, of the National Inventory of Needs for Sanitation Facilities. The inventory, Water Supply Needs in States, indicates that the existing public water supply facilities plus those that should be constructed would serve a total of about 86,300,000 persons in the United States. Likewise, the inventory, Sewerage and Water Pollution Abatement, shows that sewers are now available to or could be provided for a total of approximately 84,000,000 people. It is apparent, therefore, that approximately 50,000,000 people in this country, or more than one-third of the population, must be served by individual water and sewerage facilities. Thus the provision and maintenance of at least safe water supplies and sanitary methods of excreta disposal for this portion of the population is a problem of considerable magnitude.

Only the minimum types of water supply and sewerage facilities required to protect the health of the rural population are included in this inventory of rural sanitation needs. Consequently, no estimates are included as to the number of rural homes which have or might be provided with water under pressure and water-carriage systems of sewage disposal. These facilities are desirable but not essential from the public health standpoint because certain types of hand pumps and adequately protected wells supply safe water and properly constructed privies provide sanitary means of excreta disposal.

RURAL WATER SUPPLIES

Water is a necessity in the home for drinking, culinary, bathing, and laundry purposes. Therefore, the householder who is not served by a community water supply system must have a source of water from a well, cistern, spring, stream, or from his neighbor's supply. Convenience and aesthetic considerations were controlling factors in the selection of the source and type of water supply until it was discovered that typhoid fever and other enteric diseases resulted from drinking contaminated water. Public health workers then began consideration of methods to provide safe water supplies.

It is not practicable generally to provide water treatment facilities to serve the rural population. Therefore, the safety of the water supplied to rural homes is dependent upon the source of the water and the protection of the water from contamination at the source and

while in transit to the user. Consequently, the guidance of a qualified sanitary engineer in the selection of a source of water, the construction of the water supply facility, and its proper maintenance is essential.

Health organizations have done much to improve the quality of water supplied to rural homes through improvements in the design of wells and cisterns and the appurtenant equipment and in promoting their use in the rural areas. However, a greater appreciation of the essentiality of a safe water supply on the part of the rural people, further improvements in the design of wells, cisterns, and pumps, and closer supervision over their construction and operation are of importance in connection with efforts to improve the sanitary quality of water available to the rural population. Therefore, educational, research, and technical supervisory work by health agencies pertaining to rural water supplies is indicated.

The inventory of this phase of rural sanitation is based on information obtained from the National Inventory of Needs for Public Water Supplies, and the 1940 Census Reports on Housing Characteristics. Part I of the National Inventory of Needs for Sanitation Facilities indicates that about 84,500,000 persons in this country are now served by public water supplies and that it would be feasible to provide new water systems for approximately 1,800,000 additional people. This would leave an estimated 50,000,000 people or 12,000,000 homes to be served by private water supplies. Table 1, compiled from data of the 1940 Census reports on housing, shows that there are 1,530,097 rural homes without a water supply within 50 feet and that 5,018,279 rural homes have a water supply other than running water within 50 feet. This indicates that a total of approximately 6,550,000 rural homes in this country are not supplied with running water.

A water supply not within 50 feet of the home is not considered satisfactory because of its inconvenience to the householder and, therefore, it is assumed that a new supply should be provided. It is estimated that 75 percent of the wells, springs, and cisterns within 50 feet of the residence have sanitary defects such as improper construction, equipment, or maintenance which permit contamination of the water. On this basis, the 1,530,097 homes without a water supply within 50 feet and 75 percent of the remaining 5,018,279 homes without running water, or a total of approximately 5,294,000 rural homes, should have new or improved water supplies. The varying nature and extent of the necessary improvements to private water supplies and the wide range of cost due to local conditions in the construction of new supplies make it difficult to attempt the derivation of an average cost per home for the provision or improvement of these facilities. However, on the basis of the experience of the Farm Security Administration, it appears that $50 per home

might be considered reasonable. Applied to 5,294,000 homes the total estimated cost would be about $265,000,000 to provide safe water supplies necessary for the rural population.

RURAL SEWAGE DISPOSAL FACILITIES

A major phase of rural sanitation is the provision and maintenance of facilities for the disposal of human excreta in a sanitary manner. Wherever possible this should be accomplished through public sewerage systems. However, the majority of rural homes are so located that public sewers are impracticable and, therefore, the septic tank, privy, or other facility for excreta disposal must be utilized. In those instances where water-carriage systems of sewage disposal cannot be provided, privies properly constructed and maintained afford a sanitary means of excreta disposal.

The construction of sanitary privies as a public health measure to control hookworm disease was inaugurated in this country about the year 1910. The Rockefeller Sanitary Commission was established in 1909 for the purpose of combating hookworm disease. This Commission, the State boards of health, and the United States Public Health Service made sanitary and hookworm infestation surveys in 700 counties of 11 southern States and carried on control programs which consisted of treatment and the installation of sanitary privies. Concurrently, the United States Public Health Service conducted rural sanitation demonstration projects. The hookworm control programs and these projects during the period 1910 to 1920 demonstrated that sanitary privies were very effective in the control of intestinal diseases.

By 1920, the promotion of sanitary excreta disposal facilities in areas where sewers were impracticable was well recognized as an essential need by State and local health departments. Plans, specifications, and regulations governing the construction and maintenance of septic tanks and sanitary privies were developed. Sanitation personnel was assigned to conduct sanitary surveys and educational campaigns, enforce the sanitary laws where necessary, and to supervise the construction of septic tanks and privies. Several types of privies were developed, the most important of which were the box and can, concrete vault, and earth pit. The earth pit privy was found to be superior to the other types because it did not require scavenging. Thus, this type of privy was adopted by most State health departments. Rural sanitation work was continued without Federal assistance for labor or materials until the latter part of 1933.

In December 1933, the Civil Works Administration was inaugurated to relieve unemployment. With the inception of this program, the United States Public Health Service, recognizing the opportunity to

advance rural sanitation work, secured an allotment of CWA funds for the construction of sanitary privies. The Civil Works Administration furnished the necessary labor and the property owners provided the materials. The technical supervision of the community sanitation projects was rendered by the Public Health Service, State and local health departments. This program, although of short duration, demonstrated that the construction of sanitary privies was a desirable work relief project. Thus, similar community sanitartion projects were continued under the Federal Emergency Relief Administration and the Work Projects Administration. During the period from December 1933 through June 1942, 2,911,323, or roughly three million, sanitary privies were constructed in 38 States and in Puerto Rico through the cooperative efforts of the CWA, FERA, WPA, State health departments, and the United States Public Health Service.

Observations of privies constructed prior to the inception of the Federal Work Relief Program revealed that practically all of the pit privies had wood floors and risers which rapidly decayed and were difficult to keep clean. Recognizing the need for a more permanent type of construction, the Public Health Service developed a concrete slab and riser type of privy. The majority of State health departments either adopted the Service design or developed some type of concrete slab and riser earth pit privy. After some observations a number of States made this type of construction mandatory and about 90 percent of the privies constructed during the fiscal year 1939 under the Community Sanitation Program were of this type.

Considerable progress has been made in the provision of sanitary facilities for rural areas where sewers are impracticable. This phase of rural sanitation has been established as an important function of State and local health departments and in many instances the improvement of sanitary conditions in rural areas is included as a major component of their sanitation programs. The design of sanitary privies has been improved considerably and regulations have been adopted in some States governing the construction and maintenance of sanitary facilities in rural areas.

This inventory clearly indicates that there are a large number of rural homes in this country not served by adequate sanitary facilities. Part III of the National Inventory of Needs for Sanitation Facilities shows that 78,905,826 people in the United States are served by community sewers and that it would be practicable to provide new sewer systems for an additional 4,835,847 persons. On this basis, it appears that septic tanks, privies, or similar facilities must be utilized by approximately 52,000,000 people in about 12,000,000 homes in rural areas of this country.

Table 1, a tabulation of data from the 1940 Census Reports on Housing Characteristics, shows that there is a total of 12,971,360 rural homes in nonincorporated areas, of which 8,505,572 are served by outside toilets and 846,148 have no toilet facilities whatsoever. It is estimated that 50 percent of the existing privies are insanitary and should be replaced, and that the average cost of this work would be $35 per privy. Thus, it appears that the provision of privies for the 846,148 homes now without any sanitary facilities and replacing one-half of the privies now serving 8,505,572 homes, or the construction of a total of approximately 5,100,000 sanitary privies, is needed to provide minimum sanitation facilities for the rural population of the United States. On the basis of an average cost of $35 per privy, a rough estimate of the cost of this work is about $180,000,000.

METHODS OF COMPILING THE NATIONAL INVENTORY OF RURAL SANITATION NEEDS

Part I, "Public Water Supply Needs in States," and Part III, "Sewerage and Water Pollution Abatement," of the National Inventory of Needs for Sanitation Facilities include estimates of the additional public water supply and sewerage facilities needs for all incorporated places with 200 or more people. To avoid duplication, the "Inventory of Rural Sanitation Needs" includes only those homes in nonincorporated communities. This procedure does not include the sanitation needs of the incorporated communities with populations of less than 200 in the National Inventory. However, there are nonincorporated rural communities served by public water and sewerage systems or in which the installation of these facilities on a community basis would be practicable. Therefore, the inclusion of the rural sanitation needs for this group of communities in this inventory has been considered as compensating for the omission of the sanitation facilities needed in the incorporated communities with populations of less than 200.

The 1940 Census Reports on General Characteristics of Housing, Second Series, show the number of rural farm and nonfarm homes with (1) no running water supply within 50 feet; (2) no water supply within 50 feet; (3) outside toilet or privy; and (4) the number of homes with no toilet or privy. The number of rural farm homes in each of these categories included in table 1 was taken directly from the Census Reports. However, in these reports nonfarm dwelling units located outside urban places or in incorporated communities with populations less than 2,500 were classified as "rural nonfarm." Thus, to avoid duplicating the sanitation needs of Parts I and III of the National Inventory, the sanitation facilities needed for only those rural nonfarm homes outside of incorporated communities were included in this inventory. The number of rural nonfarm homes in

unincorporated areas was obtained from unpublished data compiled by the Bureau of the Census. The ratio by States of the rural nonfarm dwellings in unincorporated places to the total rural nonfarm homes was determined and applied to the total rural nonfarm dwellings included in the Census Reports under the above-mentioned items 1, 2, 3, and 4. The resulting values plus those for the rural farm homes which have been used as the basis for this inventory of rural sanitation needs are included in table 1.

TABLE 1.—*Showing by States the number of rural homes served by individual water supplies and outside toilets on basis of 1940 Census reports*

State	All rural dwelling units	Water supply other than running water within 50 feet	No water supply within 50 feet	Outside toilet or privy	No toilet or privy
Alabama	*432,393*	*248,573*	*102,519*	*300,763*	*89,284*
Rural nonfarm	121,318	43,252	23,169	81,211	10,722
Rural farm	311,075	205,321	79,350	219,552	78,562
Arizona	*87,985*	*8,643*	*23,872*	*41,523*	*14,129*
Rural nonfarm	55,822	5,172	7,587	26,469	3,016
Rural farm	32,163	3,471	16,285	15,054	11,113
Arkansas	*337,026*	*227,900*	*47,914*	*274,892*	*41,641*
Rural nonfarm	60,389	28,224	9,077	44,903	4,003
Rural farm	276,637	199,676	38,837	229,989	37,638
California	*608,142*	*29,690*	*17,132*	*174,118*	*9,217*
Rural nonfarm	415,528	15,171	10,365	92,645	6,160
Rural farm	192,614	14,519	6,767	81,473	3,057
Colorado	*127,669*	*43,210*	*20,245*	*93,296*	*3,881*
Rural nonfarm	52,011	9,245	6,071	30,319	1,190
Rural farm	75,658	33,965	14,174	62,977	2,691
Connecticut	*170,247*	*9,553*	*2,318*	*35,216*	*1,856*
Rural nonfarm	143,485	6,491	1,796	24,121	1,429
Rural farm	26,762	3,062	522	11,095	427
Delaware	*26,580*	*3,796*	*351*	*14,843*	*493*
Rural nonfarm	14,223	1,223	247	5,150	195
Rural farm	12,357	2,573	104	9,693	298
Florida	*202,395*	*68,466*	*23,883*	*121,700*	*13,642*
Rural nonfarm	123,651	31,601	12,361	64,098	5,519
Rural farm	78,744	36,865	11,522	57,602	8,123
Georgia	*425,259*	*273,300*	*62,945*	*329,043*	*47,594*
Rural nonfarm	104,240	42,335	11,083	66,344	5,669
Rural farm	321,019	230,965	51,862	262,699	41,925
Idaho	*77,796*	*21,248*	*10,575*	*55,784*	*2,509*
Rural nonfarm	23,870	3,275	2,227	13,417	757
Rural farm	53,926	17,973	8,348	42,367	1,752
Illinois	*389,410*	*187,332*	*15,972*	*293,961*	*8,798*
Rural nonfarm	129,652	45,016	5,969	77,585	2,204
Rural farm	259,758	142,316	10,003	215,376	6,594
Indiana	*349,883*	*160,851*	*13,504*	*267,984*	*7,461*
Rural nonfarm	127,416	42,824	5,596	80,284	2,325
Rural farm	222,467	118,027	7,908	187,700	5,136

some hyaline oxyphil casts. In rats 5, 6, 8, and 9 (9 days), the proximal convoluted tubules showed slight to moderate basal accumulation of fine fat droplets in their epithelium. Foamy oxyphil exudate to hyaline casts were noted in these tubules in rats 5, 6, 7, and 8. Distal convoluted tubules, glomeruli, and pyramids were normal. In the rats (1 to 4) killed in 5 days, the liver showed slight to fairly marked accumulation of fine fat droplets in the cytoplasm of liver cells. Often this fat was dissolved out when the Herxheimer acetone 70 percent alcohol sudan IV stain was used, but it was readily demonstrated with the 60 percent isopropanol technique (*2*). In rat 3 there was also slight centrolobular cytoplasmic oxyphilia of liver cells and a few mitotic figures were present. More pronounced changes were recorded in the rats (5 to 9) killed after 9 days. In 4 rats (5, 7, 8, 9) there were in the centrolobular areas numbers of huge foamy to clear cells with nuclei similar to those of surrounding liver cells. These cells were two to three times the diameter of ordinary liver cells. Their foamy cytoplasm contained little or no fat. Associated with this hydropic degeneration there were more or less midzonal and centrolobular fine fat droplet degeneration of liver cells of ordinary size, a variable grade of centrolobular congestion and atrophy of liver cell cords, and a centrolobular fibroblast proliferation varying from slight and interstitial to replacement and partial trabeculation of the parenchyma. In this new connective tissue were isolated hydropic, fatty, normal, and coagulated necrotic liver cells in varying proportions, as well as numbers of phagocytes laden with fine fat droplets. The acid-fast ceroid of the dietary cirrhosis of rats was entirely lacking. In rats 5 and 8 there were also partially organizing foci of coagulative necrosis. Here the liver cells were normal in size and arrangement, but strongly oxyphil and completely karyolytic. Definite trabeculae setting off a few nodules of surviving liver cells were present in these same 2 rats.

Three rats were killed 3½, 3¾, and 5¼ hours after ingestion of 5.0, 4.8, and 3.8 gm. per kg. Examination of the brain and spinal cord after immediate Orth fixation showed in the first rat swelling and vacuolation of some nerve cells, tigrolysis, and fine, slightly basophilic reticulation of the cytoplasm of others in the tegmentum pontis only. In the second rat swelling and vacuolation involved a greater proportion of nerve cells and appeared also in the reticular substance of the medulla, the pontile nuclei, the thalamus, and the anterior horns of the spinal cord. Changes were still more severe and more widespread in the third rat, but still chiefly in brain stem and spinal cord.

Other rats were fed DDT incorporated in their diets. Diet 146 contained 0.2 percent and was quite toxic. The last survivor was killed at 15 days and showed no significant lesions. Diet 158 contained 0.1 percent DDT and 0.2 percent cyclohexanone. This diet

was tolerated for over 3 months, but when 7 rats were killed at 94 to 98 days, all showed quite marked fine droplet fatty degeneration of the liver, generally more marked in the midzones but often extending also to the periportal and central areas of the lobules. Regularly there was also a centrolobular increase in cytoplasmic oxyphilia with decrease of the normal coarse basophilic granulation. In some rats this process went on to formation of hyaline oxyphil masses, either contiguous with the rest of the cytoplasm or separated as rounded masses lying in clear vacuoles. No significant lesions were noted in kidney, spleen, or adrenal.

Feeding 0.05 percent DDT with 25 percent casein and 5 percent yeast produced similar fatty and hyaline changes in the liver in 2 of 4 rats (D-164) and the same amount with a 5 percent casein, 5 percent yeast diet with cystine 0.5 percent (D-163) or without cystine (D-162) gave similar inconstant hyaline and fatty changes in liver cells in the two groups of 6 and 4 rats, respectively. The picture here was confused by the concurrent centrolobular fatty infiltration due to the low protein diet and shown also in the two control series D-160 (5 percent casein+5 percent yeast) and D-161 (same + 0 5 percent cystine). However, the hyaline alteration did not appear in these 8 control rats. Interestingly, the fine droplet fatty degeneration of renal proximal convoluted tubules seen in the subacute toxicity experiment and absent in the 0.1 percent DDT feeding experiments reappeared in 6 rats of these series, 2 in group D-164, 4 in group D-163

In rabbits killed in less than 5 days there were moderate to fairly marked centrolobular fine fat droplet deposition in liver cells and a moderate to fairly marked splenic hemosiderosis. In the latter much of the iron was evident as a diffuse blue staining of cytoplasm of pulp phagocytes with acidulated ferrocyanide solution, but definite granular hemosiderin was usually present as well. In several of this group fine fat droplets appeared also in the epithelium of deep cortical tubules in the kidney, epithelium of these and the more superficial convoluted tubules was swollen and finely granular, and tubules contained a little foamy oxyphil exudate. Three of these rabbits (75, 83, 84) had been fed 700, 300, and 300 mg. DDT and were killed in 10 hours, 2 days, and 2 days, respectively. The other three (94, 95, 96) had a 5-percent solution in a petroleum solvent applied to their skin over a period of 3 days, with a total dosage of 550 mg., and were killed on the fourth day. Since this petroleum solvent (varsol) by itself produced severe injury to the skin, perhaps these findings on these 8 rabbits are to be discounted.

More severe hepatic lesions were seen in a group of 5 rabbits (98, 99, 100, 101, 102) fed 50 mg. per kg. in olive oil daily to totals of 0.9 to 1.3 gm. Rabbit 98 was killed at 27 days, the other 4 died in 29, 27, 20, and 20 days.

The spleens of these rabbits were congested. Hemosiderin was scanty or lacking. The lungs showed no lesions, the kidneys moderately swollen, finely granular epithelium in the convoluted tubules, with fatty degeneration in the deep tubules as before in rabbits 101 and 102 (20 days).

Regularly the livers of these rabbits presented a more or less marked centrolobular cytoplasmic oxyphilia and hyaline degeneration. The hyaline oxyphil areas were often surrounded by a peripheral basophilic rim of cytoplasm and not infrequently were separated from it by a clear vacuole surrounding the rounded hyaline mass. Some of the cells containing this hyaline material showed normal nuclei; in a few, nuclei were enlarged and deeply stained, and in some there was karyolysis. In the rabbit (98) which was killed there was, in addition, a slight fatty degeneration with small patches and scattered isolated cells laden with fine fat droplets. In the 4 that died there was a moderate to marked fatty degeneration, and more or less numerous midzonal areas of coagulation necrosis were present. In some of these areas capillaries were occluded by fragmenting leucocyte thrombi. Some foci showed extensive polymorphonuclear leucocyte invasion, others none. A few foci of necrosis were seen also in rabbit 98. In rabbit 100 slight epithelioid cell reaction was evident and calcification of a few necrotic liver cells was seen.

Hepatic lesions similar in extent and character to the foregoing were produced in another series of 13 rabbits given DDT suspended in gum acacia solution daily by mouth in doses of 250 (5 rabbits) or 500 mg. (8 rabbits) per kg. Survival periods varied from 5 to 13 days, total dosages from 1.0 to 4.5 gm. per kg. These rabbits were numbered 3, 4, 183, 185, 186, 187, 188, 189, 191, 192, 193, 194, and 195.

In some livers the picture of hyaline oxyphil globules with or without surrounding vacuoles in the liver cell cytoplasm was the dominant feature; in others an often confluent midzonal or centrolobular coagulation necrosis grading over to granulation tissue replacement was seen. Fatty changes were usually present, often more pronounced in the hepatic cells bordering necrotic or granulating areas, and otherwise in the lobule centers. Greatly swollen foamy fat-free liver cells occurred singly or in clumps in about half of the rabbits. In this series polymorphonuclear leucocyte invasion of necrotic areas was absent, indicating that it may have been due to a secondary complication in the previous lot. Necrosis and hyaline globule degeneration were present in some measure in all 13 rabbits, some grade of proliferative reaction in 12, going on to replacement in 10. Calcification of necrotic liver cells occurred in 1 rabbit that survived 13 days.

Spleens, lungs, and kidneys showed similar minor alterations to the previous series. Brain and spinal cord showed variable amounts of vacuolation around large neurons in which coarse tigroid granules were well preserved. Myelin of spinal cord and peripheral nerves showed no fatty changes and generally appeared normal. Skeletal muscle was normal in 4 rabbits, while in rabbit 188 it showed focal areas of hyaline degeneration, necrosis, interstitia hemorrhage, and surrounding fibroblast proliferation with slight lymphocyte infiltration. Adrenals contained large amounts of lipoid and chromaffin. The heart of rabbit 186 showed diffuse dusting of the muscle fibers with very fine fat droplets, while in 3 other rabbits it was normal.

Six rabbits were killed at 16 to 19 days after receiving total doses of 1.1 gm. per kg. over 12 to 15 days by application to the skin of 5 percent solutions in dimethylphthalate alone (150, 151, 152) or containing also 10 percent cyclohexanone (153, 154, 155). One rabbit in each group showed slight fatty changes in the liver, while spleen, lung, and kidney showed no lesions.

Eleven rabbits were exposed by wrapping closely with cloth impregnated with DDT the shaved skin of the entire trunk, 3 (162 to 164) for 45 days and 8 (165 to 172) for 26 to 30 days. These rabbits presented only traces of fatty degeneration of the liver, slight and dubious parenchymatous degeneration of the kidneys, and nothing remarkable in lung, adrenal, or spleen All these 11 rabbits were killed. The amount of DDT in the wrappings varied from 2.48 to 2.785 gm.

SUMMARY AND DISCUSSION

In spite of the pronounced neurologic symptoms histologic alterations in the central nervous system have been relatively slight. Vacuolation around large nerve cells in cord and cerebral motor nuclei has been seen in cats, rats, and rabbits; tigrolysis and cell vacuolation in cats and rats.

The most striking pathologic alterations are seen in the liver. Here there is a hyaline degeneration similar to that described in poisoning by azo-benzene and some of its derivatives (*3*). Hyaline oxyphil masses are formed in the central part of the cytoplasm and then are surrounded by vacuoles. This change has been seen in rats and rabbits. Also a variable amount of fatty degeneration of liver cells, often centrolobular, is observed in cats, rats, and rabbits. Midzonal and centrolobular areas of coagulation necrosis are found in cats, rats, rabbits, which in rats and rabbits is accompanied by an interstitial and peripheral proliferative reaction leading to replacement by a new vascular granulation tissue. With more extensive and confluent necrosis this replacement process leads to trabeculation. Finally there is seen also a focal hydropic degeneration of liver cells in

rats and rabbits in which the affected cells may reach two to three times their normal diameter. Nelson (*4*) reports lesions similar to these in his rabbits, rats, and guinea pigs.

Muscle necrosis with proliferative reaction was seen in one of our rabbits, and has been noted also by Nelson in this species and in guinea pigs. He has noted also necroses of heart muscle in occasional rabbits and guinea pigs.

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THE PHARMACOLOGIC ACTION OF 2,2 BIS(P-CHLOROPHENYL) 1,1,1 TRICHLORETHANE AND ITS ESTIMATION IN THE TISSUES AND BODY FLUIDS[1]

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The compound 2,2 bis(p-chlorophenyl) 1,1,1 trichlorethane, to be referred to as DDT, was first synthesized by Zeidler in 1874 (*1*). Pharmacologically it attracted little attention until recently when entomological investigations revealed insecticidal properties of extraordinary efficacy. The toxicity of this compound, its cumulative action, and its absorbability through the skin under a variety of conditions of external application have made it desirable to devise a method for its identification in the tissues and body fluids. The symptoms which this compound produces in experimental animals strongly resemble in some respects the action of phenol. Except for the delayed onset, which may be several hours, and persistence of action, which may last for one to several days, the hyperexcitability, the generalized fine and coarse tremors, culminating in flaccid or spastic paralysis with occasional tonic and clonic convulsions preceding death by respiratory paralysis, suggested the possibility of phenol or phenol-like substances being formed in the body in the course of systemic poisoning. However, examination of the blood and tissues of rats during various phases of DDT poisoning by a

[1] From the Division of Physiology, National Institute of Health.

method previously described (*2*) failed to show significant amounts of either free or conjugated phenols. Since the DDT molecule contains 5 atoms of chlorine, 50 percent of the molecular weight of the substance, it was decided to attempt its estimation as organic chlorine. Zeidler (*1*), who first described the chemical properties of this compound, stated that hydrolysis in alcoholic KOH split off one chlorine atom thereby desaturating the aliphatic carbon bond. This was readily confirmed. Attempts at more drastic hydrolysis at higher temperatures and for longer periods failed to yield appreciably more than the theoretical 20 percent of the available chlorine. The method of oxidation with fuming H_2SO_4 described by Willard and Thompson (*3*) was tried, but this presented so many difficulties when applied to biological material that it had to be abandoned. Attention was then directed to the decomposition of the compound by reduction with metallic sodium in absolute alcohol as first described by Stepanow (*4*) and later confirmed by Bacon (*5*). This procedure when applied to the pure substance gave uniformly good results, yielding practically all the available chlorine as NaCl with great ease, and later when applied to biological material appeared to give satisfactory results.

ESTIMATION OF THE PURE SUBSTANCE

A definite amount of the substance, 10 to 20 mg., in acetone solution in which it is readily soluble, is pipetted into a 100-cc. round-bottom flask of an all glass condenser, the acetone removed by gentle heating on the water bath, and the residue dissolved in 10 cc. absolute alcohol by warming. The substance is sparingly soluble in cold alcohol but readily soluble in hot alcohol. The flask is connected with the reflux condenser, 1 gm. metallic sodium cut up in small bits is gradually added through the condenser, and in 5 to 10 minutes, when the reaction is over, the flask is lowered into a boiling water bath and the mixture is refluxed for half an hour. The contents of the flask are then transferred, with the aid of water to an Erlenmeyer flask, acidified with 3 cc. concentrated HNO_3, decolorized for a few minutes with 1 gm. of chlorine-free Nuchar,[2] filtered and washed quantitatively, and the filtrate titrated for chlorine by the Volhard method using M/35.46 $AgNO_3$ in 10 percent HNO_3 and M/35.46 NH_4SCN with ammonium ferric sulfate as indicator. The results of eight analyses of the pure material recrystallized from absolute alcohol giving an average of 48.4 percent chlorine are shown in table 1 and indicate fairly good agreement with the theoretical value of 50 percent. Two different samples were used in the course of this work, and it is possible that they were not of the same degree of purity.

[2]Nuchar W, Merck and Co., washed with dilute HNO_3 until chlorine-free and air dried.

TABLE 1.—*Estimation of chlorine in DDT by reduction with metallic sodium*

Experiment number	DDT used (mg.)	Chlorine found (mg.)	Percent chlorine [1]	Experiment number	DDT used (mg.)	Chlorine found (mg.)	Percent chlorine [1]
1	10	4.9	49.0	5	10	4.8	48.0
2	10	5.1	51.0	6	15	7.2	48.0
3	15	7.3	49.3	7	10	4.7	47.0
4	10	4.8	48.0	8	10	4.7	47.0

[1] The results of the first 3 experiments were obtained with a sample recrystallized in April 1943 and air dried the results of the last 5 experiments were obtained with another sample recrystallized in February 1944 and dried in vacuum desiccator over $CaCl_2$ for 2 days.

APPLICATION OF THE METHOD TO BIOLOGICAL MATERIAL

The ready solubility of the compound in ether and acetone suggested the possibility of recovering it from dried powdered tissues by Soxhlet extraction with either one of these solvents. In order to facilitate extraction the tissues were first dehydrated by maceration with anhydrous Na_2SO_4 (chlorine-free) to granular consistency, then dried at 90° C. for about 2 hours and ground to fine powder in an agate mortar. After Soxhlet extraction for several hours with either ether or acetone the solvent was removed on the water bath under a current of air, the dry residue taken up in 20 cc. hot absolute alcohol, filtered or centrifuged to remove any insoluble material if present, and the clear alcoholic solution divided into two equal parts; the one for direct titration of any inorganic chloride and the other for similar titration after reduction with metallic sodium as for the pure substance. With this procedure normal rabbit tissues such as blood, liver, kidney, and central nervous system showed no evidence of chlorine either before or after reduction with metallic sodium. Normal tissues with DDT added in amounts of from 10 to 20 mg. per 10 to 20 gm. of tissue and treated in this manner showed no chlorine on direct titration and the presence of chlorine after reduction with sodium, but the recoveries were irregular and usually low with a range of from 27 to 92 percent of that added. The failure to recover the substance more adequately seemed to be due to the mechanical difficulty of extracting the substance from the dried material which could not be reduced to a powder of a sufficient degree of fineness. It was then decided to attempt the extraction of the fresh tissue with acetone, after thoroughly macerating and dehydrating with Na_2SO_4 but without further drying. The acetone solution was filtered off, evaporated on the water bath under a current of air, and the process continued as previously described. With this procedure the recoveries of added DDT to normal tissues were good and uniform provided allowance was made for a small but variable amount of inorganic chlorine usually present in such extracts. That this indeed was only inorganic chlorine was demonstrated by the fact that acetone extracts of normal tissues with no DDT added gave identical values on titration after reduction

with sodium as without such reduction. The procedure of acetone extraction of fresh tissues dehydrated to granular consistency with anhydrous Na_2SO_4 was therefore adopted. After further experimentation it was found that the small amount of chlorine in the acetone extracts on direct titration can be reduced to a negligible minimum by redissolving the residue of the evaporated acetone extract in 2 to 3 portions of 5 to 10 cc. fresh acetone and filtering or centrifuging off the insoluble material before finally taking up the dried residue in hot absolute alcohol for reduction.

Table 2 shows the analytical results of experiments on normal rabbit tissues and excreta without and with the addition of DDT and the percentage recoveries in the latter instance.

TABLE 2.—*Estimation of DDT in rabbit tissues and excreta by the acetone extraction method and differential titration for chlorine. T=trace*

NO DDT ADDED

Number	Tissue	Gm. or cc.	Anhydrous Na_2SO_4 used (gm.)	Acetone used (cc.)	Mg chlorine found in each half of extract		Percent DDT recovered
					Direct titration	After reduction	
1	Blood	20	120	200	1.1	1.1	0
2	Blood	20	120	200	[1] T	0	0
3	Liver	16	80	150	0.7	0.6	0
4	Liver	20	100	200	[1] T	T	0
5	Kidney	16	80	160	1.4	1.5	0
6	Kidney	12	50	75	1.3	1.3	0
7	Kidney	12	60	135	[1] T	T	0
8	C N S	12	50	75	1.5	1.5	0
9	C N S	13	65	145	[1] 0.1	0.1	0
10	C N S	17	85	170	[1] T	T	0
11	Bile	1.2	10	50	0.0	0.0	0
12	Bile	0.5	10	100		0.0	0
13	Feces	10	50	100	0.0	0.0	0

B. 20 MG. DDT ADDED

Number	Tissue	Gm. or cc.	Anhydrous Na_2SO_4 used (gm.)	Acetone used (cc.)	Direct titration	After reduction	Percent DDT recovered
1	Blood	20	120	150	1.6	6.7	102
2	Blood	20	120	200	1.4	6.0	92
3	Blood	20	120	275	[1] 0.0	3.8	76
4	Liver	17	100	200	0.4	5.3	98
5	Liver	20	100	270	[1] T	4.2	84
6	Kidney	16	100	200	1.3	5.9	92
7	Kidney	14	70	190	[1] 0.0	4.4	88
8	C N S	14	80	200	0.2	4.9	94
9	C. N. S	14	70	190	[1] 0.0	4.5	90
10	Feces	10	50	100	0.0	4.4	88
11	Bile	2	20	100	0.0	5.0	100

[1] Residues of evaporated acetone extracts redissolved in fresh acetone and insoluble material removed by filtration.

The estimation of DDT in rabbit bile or feces is carried out in the same manner except that the direct chlorine estimation in the extract may be omitted, since upon analysis of several samples of bile and feces from normal rabbits no chlorine was found in the acetone extracts prepared as described either before or after reduction with sodium, while the recovery of added DDT was nearly quantitative.

The estimation of DDT in urine is best carried out by shaking out the acidified urine in a separatory funnel three to four times with half volume of ether. Acidification of the urine with acetic acid to a pH of about 4 gives as good results as with the use of stronger acids such as H_2SO_4 added up to 5 percent. The ether extract is washed with water until the washings are free of chlorine. With some urines heavy emulsions form. This is best dealt with by adding sufficient anhydrous sodium sulfate to the ether-emulsion mixture in a beaker to complete dehydration, and the ether extract and washings are shaken out in a separatory funnel once or twice with water until chlorine-free. The ether is evaporated, the residue taken up in absolute alcohol, reduced with sodium, and titrated as previously described. Added DDT to normal urine has been recovered by this process to the extent of from 84 to 90 percent. Ether extraction of alkaline urine has given poorer results, and extraction of acidified urine with petroleum ether or toluol has not proved satisfactory. Table 3 gives the results obtained with recoveries of added DDT to normal rabbit urine, and one human urine. In all cases the urines were acidified with acetic acid.

TABLE 3.—*Recovery of added DDT to normal rabbit urine by ether extraction*

Number	Urine (cc.)	DDT added (mg.)	Mg. chlorine found in each half of extract		Percent DDT recovered
			Direct titration	After reduction	
1	60	20	0	4 3	86
2	75	10	0	2.1	84
3	45	20	0	4 3	86
4	45	16	0	3 6	90
5	[1] 100	20	0	4 2	84

[1] Human urine.

TOXICITY OF DDT

Because of the insolubility of this substance in water it has been necessary to administer the compound in solution in olive oil or in aqueous suspension with gum acacia. Gastro-intestinal absorption when given in aqueous suspension is irregular and poor, consequently the toxicity of the substance when given in this manner is much lower than when given in olive oil. The LD^{50} in rats when given intragastrically in 1 to 5 percent solution in olive oil is 150 mg. per kg.; in rabbits 300 mg. per kg. Death may often be delayed for several days. It may be of interest to compare the toxicity of this compound with that of phenol, similarly administered, it being more than three times as toxic as phenol in rats and possibly twice as toxic in rabbits. The symptoms, consisting of hyperexcitability, generalized fine and coarse tremors, spasticity progressing to flaccid

type of paresis of the extremities, do not come on for several hours. When developed the symptoms persist in rabbits and rats for a day or two and in cats usually for several days until recovery or death ensues. In cats a condition of persistent extensor rigidity with opisthotonos with fine and coarse muscular twitchings, especially of the muscles of the head and neck, has been observed to last for several days following a single oral dose of 300 mg. per kg. Two cats, receiving 100 and 200 mg. per kg., respectively, survived.

In table 4 are summarized the data on the acute toxicity of DDT in rats, rabbits, and cats.

TABLE 4—*Acute toxicity of DDT in rats, rabbits, and cats—oral administration in olive oil*

Number of animals	Weights	Dose (mg. per kg.)	Symptoms	Percent mortality
RATS				
6	100–190	50	Hyperexcitability and mild tremors	0
6	125–150	100	Tremors	0
28	200–300	150	Severe tremors	50
17	200–290	200	Tremors and paralysis	60
RABBITS				
5	2.0–2.1	50	Hyperexcitability	0
6	1.5–2.3	100	Hyperexcitability	0
3	1.8–2.5	150	Tremors	33
4	2.5–2.6	200	Tremors	25
8	1.3–2.1	300	Tremors and paralysis	50
CATS				
1	2.5	100	No effects	Survived
2	2.7	200	Tremors, spasticity, and dyspnea	One died
8	1.7–3.1	300	Tremors, spasticity, paralysis, tonic and clonic convulsions 2 to 5 days.	62

The effects of DDT in experimental animals are cumulative, and small single doses given repeatedly lead to chronic poisoning. In a group of 10 rats of about 80 gm. weight, DDT fed at a level of 0.1 percent in a semisynthetic adequate diet containing 18 percent protein as casein was uniformly fatal in from 18 to 80 days. Generalized tremors were present throughout. When fed at a level of 0.05 percent the animals survived 3 months, though there was some impairment of growth. Mild symptoms of hyperexcitability and some tremors were usually present.

In rabbits the daily oral administration of 50 mg. per kg. in olive oil, a dose which by itself produces only slight or no demonstrable effects, resulted in cumulative effects terminating in death in from 15 to 23 days after a total dose of from 0.75 to 1.25 gm. per kg. had been given. Under these conditions of administration the central nervous system effects were less pronounced, while parenchymatous degenera-

tion of the liver was the most pronounced finding. Hyaline centrolobular and midzonal degeneration with a variable amount of coagulation necrosis was a uniform finding. A more detailed discussion of the microscopic pathology of acute and chronic DDT poisoning is given in a separate publication (*6*). The results of the study on chronic toxicity in rabbits are summarized in table 5. Attention may be directed to the mild degree of anemia as evidenced by a reduction of the hemoglobin level. White blood cell counts failed to indicate significant deviations from the normal. In like manner two cats receiving 50 mg. per kg. every day or every second or third day developed all the characteristic symptoms of poisoning and died, one within 12 days after a total dose of 500 mg. per kg. and the other within 15 days after a total dose of 300 mg. per kg. A third cat having received 4 doses of 90 mg. per kg. within 10 days died with all the typical symptoms of tremors, ataxia, spasticity, paralysis, and terminal extensor rigidity.

TABLE 5.—*Chronic toxicity and cumulative action of DDT in rabbits when administered orally daily in doses of 50 mg. per kg. in olive oil*

Rabbit number	Weight (kg.)	Hemoglobin (gm.)		Number of doses given	Total fatal dose (gm. per kg.)	Necropsy findings
		Initial	Final			
98	1.8	14.2	11.2	23	1.15	Coagulation necrosis and hyaline degeneration of the liver.
99	2.0	13.2	10.6	25	1.25	Do
100	1.7	11.1	11.0	23	1.15	Coagulation necrosis of the liver
101	1.8	13.1	------	18	90	Liver necrosis
102	1.6	12.9	10.8	18	90	Do
103	2.0	13.0	-	15	75	Do

ABSORPTION OF DDT FROM THE SKIN

These experiments were carried out upon rabbits and the applications were made either in solution in dimethylphthalate over the shaved skin of the anterior abdominal surface or by snugly applying cloths, impregnated with DDT in acetone solution and air-dried, around the shaved skin of the body corresponding to an area of from the upper thoracic to the lower lumbar vertebrae. The solvent dimethylphthalate is nonirritant as far as could be determined nonabsorbable through the skin, and of rather low toxicity when given orally to rabbits.[3] The results of this experiment showed that the application to the skin of DDT in dimethylphthalate solution is definitely toxic while the absorption of DDT from the skin when exposed to the material impregnated in cloths is slight. Some evidence of absorption has been obtained even under these conditions. The results of these tests are shown in tables 6 and 7 The symptomatology and the abnormal retention of intravenously injected rose

[3] The MLD in rabbits is 3.0 cc per kg., in rats 7.5 cc. per kg.

bengal leave no doubt of the deleterious effect of the DDT applied in dimethylphthalate solution on the central nervous system and the liver. The possibility of ingestion of the drug was ruled out by the application of this solution four times daily, only during a period of some 6 to 7 hours, while the animal was immobilized on its back, and at the end of the daily applications the material was carefully swabbed off with cotton wool moistened with acetone and alcohol. The only evidence of skin adsorption of DDT from impregnated cloths is the systemic effects on the central nervous system seen in about half of the animals.

TABLE 6.—*Evidence of skin absorption of DDT applied to the skin of rabbits as 5 percent solution in dimethylphthalate. Series A, no cyclohexanone, Series B, 10 percent cyclohexanone added*

Number	Weight (kg.)		Daily topical applications		Days	Symptoms	Plasma rose bengal mg. percent at 30 minutes[1]
	Initial	Final	Cc per kg.	Mg DDT per kg.			
150	1 6	1 4	2 0	100	12	Hyperexcitability, spasticity, and paralysis	1.0
151	1 8	1 4	2 0	100	12	Generalized paresis	.9
152	1 7	1 4	2 0	100	13	Tremors and hyperexcitability	1 0
153	2 0	1 8	2 0	100	14	Hyperexcitability	1 2
154	1.6	1 4	2 0	100	14	Tremors and spasticity	4
155	1 6	1.6	2 0	100	15	None	

[1] Normally 0.3 to 0 6 mg percent with an average of 0 4 mg percent (7)

TABLE 7.—*Skin absorption of DDT applied to rabbits in impregnated cloths over a period of 26 to 30 days*

Rabbit number	DDT (gm)	Weight (kg.)		Hemoglobin (gm. per 100 cc)		Symptoms	Plasma rose bengal mg percent at 30 minutes[1]
		Initial	Final	Initial	Final		
165	2.78	1 7	2.3	16 8	16 5	None	0 4
166	2.55	1 6	2 0	14.8	14 2	Tremors	.7
167	2.63	1.7	1.9	15 3	16 8	Hyperexcitability	.5
168	2.69	1 8	2 2	14 8	14 8	Tremors	.7
169	2.63	1.7	1 6	13 0	16 8	Hyperexcitability	.5
170	2.66	1.6	1.8	12 5	14 9	None	.9
171	2.62	1.5	1 7	15 0	17 6	None	.6
172	2 70	1.8	2 2	15 0	14.2	None	.4

[1] Normally 0 3 to 0.6, average 0 4 mg. percent (7)

INFLUENCE OF CYCLOHEXANONE ON THE TOXICITY OF DDT

Cyclohexanone, on account of its solvent and other properties, has been suggested for use in combination with DDT under certain conditions. Cyclohexanone is a narcotic by contrast with DDT, which is a convulsant. The acute toxicity of cyclohexanone in rats is about

2 gm. per kg., hence about one-tenth as toxic as DDT.[4] Combinations of the two administered to rats to ascertain the mutual effects upon each other have shown that two to six times as much of cyclohexanone may be given with DDT without adversely affecting the acute toxicity of the latter. Indeed, cyclohexanone appeared to afford some degree of antagonism to DDT, and it seems possible that narcotics in general may exhibit a similar antagonism. The application to the skin of rabbits of 5 percent DDT in dimethylphthalate with 10 percent cyclohexanone showed no greater toxicity than the DDT alone (series B, table 6). In a series of experiments on chronic toxicity in rats in which 0.2 percent cyclohexanone was fed with 0.1 percent DDT, all the animals survived a period of 90 days. It will be recalled that 0.1 percent DDT alone under the same experimental conditions showed a high rate of mortality, deaths occurring as early as the eighteenth day of the experiment.

DISTRIBUTION OF DDT IN TISSUE AND BODY FLUIDS

This work is in progress, and only one typical experiment is given to show the applicability of the method here described. A rabbit, No. 199, weighing 1.8 kg., was given orally 0.55 gm. DDT per kg. in olive oil. Severe generalized tremors and paralysis developed and continued for 2 days. At this time the animal was killed by exsanguination from the carotid artery. Samples of blood, liver, kidney, and central nervous system were taken for analysis by the acetone extraction method of the dehydrated tissues as described. The bile, 1.5 cc., obtained at necropsy was worked up in the same manner, and 100 cc. of bladder urine was extracted with ether as described. Chlorine determinations made by difference of that after reduction with sodium minus that obtained by direct titration gave the following values calculated as DDT per 100 gm. or cc.:

Blood	10.7 mg.
Liver	6.3 mg.
Kidney	3.9 mg.
Brain and cord	16.0 mg.
Bile	80.0 mg.
Urine	16.8 mg.

These values may be 10 to 20 percent low since the recoveries of added DDT have usually been around 80 to 90 percent.

DISCUSSION

The toxicity of DDT combined with its cumulative action and absorbability from the skin places a definite health hazard upon its

[4] In rabbits the MLD for cylohexanone given orally is stated to be between 1.6 and 1.9 gm. per kg. (8).

use. Symptomatically the effects on the central nervous system are the most obvious, damage to the liver is less obvious and for this reason perhaps more serious. Knowledge of the mode of action of this substance in the body, its distribution, elimination, and detoxification will be helpful in guarding against accidental poisoning. Adequate means of detecting incipient poisoning are needed. The test we have described for estimating DDT in biological material based on its chlorine content assumes the compound to be in its original and unchanged form. For this there is no proof at present, and it is not at all impossible that it does undergo some degradation in the body. Until more information on its metabolic fate in the body becomes available, such an assumption is permissible, and it is believed the test should serve a useful purpose.

SUMMARY

The acute and chronic toxicity, the cumulative action and absorbability from the skin of 2,2 bis (p-chlorophenyl) 1,1,1 trichlorethane (DDT) in experimental animals are described. A method is suggested which appears suitable for the estimation of DDT in the tissues, body fluids, and excreta. The method is based on the extraction of the substance by suitable solvents and the determination of the organically bound chlorine after reduction with metallic sodium in absolute alcohol. With this method DDT has been found in the urine, bile, blood, liver, kidney, and central nervous system in experimental poisoning with the substance.

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PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 22, 1944

Summary

A total of 568 cases of poliomyelitis was reported, as compared with 462 last week, 137 for the 5-year (1939–43) median, and 329 for the week last year, which was the largest number recorded for a corresponding week of the past 17 years. Of the current total, an aggregate of 402 cases, or 70 percent, was reported in 6 States, as follows (last week's figures in parentheses): New York, 153 (93); Pennsylvania, 56 (31); Michigan, 24 (10); Virginia, 30 (39); North Carolina, 62 (63); and Kentucky, 77 (66). Ohio reported 14 cases, Illinois 13, California 11, and Indiana and Maryland 10 each.

For the country as a whole, 1,542 cases have been reported since June 24, as compared with 1,162 in 1934, the largest number previously recorded for a corresponding 4-week period, and 1,061 and 1,013, respectively, last year and in 1937. Exclusive of the 3 years mentioned, the average number of cases reported for the corresponding 4-week periods of the past 17 years was 388. The total to date this year is 2,324, as compared with 1,955 for the same period last year and a 5-year median of 1,148.

A decrease was recorded in the incidence of meningococcus meningitis. A total of 186 cases was reported, as compared with 205 last week, 188 for the next earlier week, 237 for the same week last year, and a 5-year median of 34. States reporting the largest numbers are New York, 34; California, 11; Massachusetts, New Jersey, and Pennsylvania, 10 each; and North Carolina and Texas 8 each. The cumulative total to date is 12,418, as compared with 12,779 last year and a 5-year median of 1,302.

Of a total of 184 cases of typhoid fever, as compared with 148 last week and 308 for the 5-year median, 21 were reported in Texas, 15 in Louisiana, 14 in Georgia, 12 in North Carolina, and 11 each in South Carolina and Kentucky. The cumulative total is 2,585, as compared with 2,424 for the period last year and a 5-year median of 3,277.

Of a total of 25 cases of Rocky Mountain spotted fever, as compared with 35 for the week last year, 16 occurred in the South Atlantic area, 1 in New York, and 8 in the central areas.

Deaths recorded in 93 large cities of the United States totaled 7,783 for the current week, as compared with 8,845 last week and a 3-year (1941–43) average of 8,188. The cumulative total is 271,912, as compared with 278,240 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended July 22, 1944, and comparison with corresponding week of 1943, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–1943	Week ended—		Median 1939–1943	Week ended—		Median 1939–1943	Week ended—		Median 1939–1943
	July 22, 1944	July 24, 1943		July 22, 1944	July 24, 1943		July 22, 1944	July 24, 1943		July 22, 1944	July 24, 1943	
NEW ENGLAND												
Maine	1	0	0	...	...	...	10	43	43	1	0	0
New Hampshire	0	0	0	...	...	...	5	5	2	0	1	0
Vermont	0	0	0	...	...	...	7	65	29	0	1	0
Massachusetts	5	6	2	...	...	...	177	222	222	10	11	0
Rhode Island	0	0	0	13	1	...	8	73	38	2	5	1
Connecticut	0	0	0	...	...	1	37	69	69	5	7	0
MIDDLE ATLANTIC												
New York	6	9	9	(1)	[1] 2	[1] 2	152	668	491	34	26	4
New Jersey	1	0	2	4	3	2	121	513	251	10	11	1
Pennsylvania	5	6	6	1	...	...	131	92	98	10	22	3
EAST NORTH CENTRAL												
Ohio	0	7	7	1	5	5	18	156	73	7	7	0
Indiana	7	2	2	3	3	3	4	48	14	4	0	1
Illinois	3	10	14	1	12	4	32	232	106	5	16	1
Michigan [2]	4	2	3	...	2	1	84	793	241	7	15	2
Wisconsin	1	1	2	9	7	7	168	468	373	1	4	0
WEST NORTH CENTRAL												
Minnesota	3	5	1	...	...	1	33	105	23	3	0	0
Iowa	3	1	1	...	...	...	30	24	53	4	0	0
Missouri	5	4	4	...	...	...	5	29	11	3	11	0
North Dakota	0	0	1	...	...	...	1	40	8	3	0	0
South Dakota	0	0	1	...	...	...	0	7	7	0	1	0
Nebraska	0	4	1	3	1	1	11	10	6	0	0	0
Kansas	1	0	2	4	1	1	22	52	41	0	2	0
SOUTH ATLANTIC												
Delaware	0	0	0	...	...	...	1	2	2	0	0	0
Maryland [2]	0	0	1	...	2	1	11	58	15	5	7	4
District of Columbia	0	0	0	...	...	...	9	34	14	1	1	0
Virginia	2	7	10	38	39	24	30	46	46	7	10	5
West Virginia	3	4	3	...	2	1	14	88	6	2	0	0
North Carolina	6	4	4	...	...	...	50	37	37	8	7	0
South Carolina	5	12	3	87	133	92	38	14	14	6	4	0
Georgia	7	4	3	7	10	10	12	10	9	0	2	1
Florida	16	4	3	2	9	4	45	10	10	6	1	0
EAST SOUTH CENTRAL												
Kentucky	3	1	2	1	1	...	13	19	19	2	0	1
Tennessee	3	4	2	10	3	8	6	16	25	3	6	0
Alabama	3	1	4	12	31	11	12	27	27	4	5	3
Mississippi [2]	3	2	2	...	...	...	...	...	...	0	3	0
WEST SOUTH CENTRAL												
Arkansas	3	4	3	13	...	5	21	11	11	1	4	1
Louisiana	5	12	5	8	6	4	7	5	5	2	3	0
Oklahoma	0	3	2	...	2	4	9	9	6	3	3	0
Texas	23	23	22	160	231	79	125	101	101	8	4	1
MOUNTAIN												
Montana	0	0	0	...	...	1	3	65	25	1	0	0
Idaho	0	0	0	...	2	...	2	4	3	0	0	0
Wyoming	0	0	0	...	...	...	9	8	4	0	0	0
Colorado	6	3	10	...	2	5	8	9	24	0	0	0
New Mexico	0	0	1	...	1	1	18	8	8	0	0	0
Arizona	0	0	0	16	31	25	13	12	12	0	1	1
Utah [2]	0	0	0	6	...	...	19	33	33	2	1	0
Nevada	1	0	0	...	...	...	21	5	1	0	1	0
PACIFIC												
Washington	2	6	1	...	...	...	61	36	36	3	4	0
Oregon	1	7	1	7	5	5	39	32	36	2	7	0
California	17	11	13	3	37	11	442	288	288	11	23	1
Total	154	169	148	409	584	327	2,094	4,701	3,318	186	237	34
29 weeks	5,998	6,615	6,974	336,856	79,477	150,548	586,074	528,294	461,421	12,418	12,779	1,302

[1] New York City only.

[2] Period ended earlier than Saturday.

***Telegraphic morbidity reports from State health officers for the week ended July 22, 1944, and comparison with corresponding week of 1943, and 5-year median*—Con.**

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43,	Week ended—		Median 1939-43,	Week ended—		Median 1939-43
	July 22, 1944	July 24, 1943		July 22, 1944	July 24 1943		July 23 1944	July 24, 1943		July 22, 1944	July 24, 1943	
NEW ENGLAND												
Maine	0	0	0	7	16	5	0	0	0	0	0	0
New Hampshire	3	0	0	0	2	2	0	0	0	1	0	0
Vermont	0	0	0	2	2	2	0	0	0	0	0	0
Massachusetts	6	0	1	35	93	37	0	0	0	3	8	1
Rhode Island	0	1	0	0	10	3	0	0	0	0	0	0
Connecticut	0	2	1	12	18	12	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	153	10	6	67	79	79	0	0	0	4	8	10
New Jersey	7	0	1	15	19	24	0	0	0	1	3	3
Pennsylvania	56	2	3	62	41	43	0	0	0	3	6	10
EAST NORTH CENTRAL												
Ohio	14	2	1	51	47	51	0	0	0	2	39	9
Indiana	10	1	1	10	10	10	0	0	0	4	3	3
Illinois	13	7	6	35	37	59	0	2	1	4	5	8
Michigan[1]	24	1	7	48	26	61	1	2	1	1	45	6
Wisconsin	2	1	0	37	49	34	0	0	1	1	0	0
WEST NORTH CENTRAL												
Minnesota	3	0	0	29	10	19	0	0	0	0	0	0
Iowa	8	0	1	8	8	9	0	1	1	1	0	2
Missouri	3	4	2	9	10	12	0	0	1	8	5	5
North Dakota	3	0	1	5	0	2	0	0	0	0	0	0
South Dakota	0	0	0	0	5	6	0	0	0	0	0	0
Nebraska	3	1	1	2	4	3	0	0	0	0	0	0
Kansas	5	7	2	9	13	13	0	0	0	0	1	2
SOUTH ATLANTIC												
Delaware	0	0	0	0	1	1	0	0	0	0	0	0
Maryland[1]	10	1	1	21	21	13	0	0	0	4	2	3
District of Columbia	8	0	0	3	3	3	0	0	0	0	0	0
Virginia	30	2	2	18	3	4	0	0	0	4	2	7
West Virginia	4	0	2	25	13	13	0	0	0	5	8	10
North Carolina	62	3	3	18	6	10	2	0	0	12	3	12
South Carolina	4	2	3	5	5	2	0	0	0	11	8	12
Georgia	5	1	4	11	11	11	0	0	0	14	14	23
Florida	5	0	1	4	1	1	0	0	0	7	3	3
EAST SOUTH CENTRAL												
Kentucky	77	0	4	8	7	15	1	1	0	11	9	11
Tennessee	1	0	1	17	18	12	0	0	0	9	6	14
Alabama	7	0	3	8	10	6	0	0	0	8	12	8
Mississippi[1]	5	0	1	3	2	2	0	0	0	4	14	7
WEST SOUTH CENTRAL												
Arkansas	0	6	1	5	9	2	0	0	0	9	9	19
Louisiana	5	10	3	4	2	3	0	0	0	15	7	14
Oklahoma	4	42	0	0	6	6	0	0	0	4	3	9
Texas	9	96	7	31	18	17	1	2	0	21	25	38
MOUNTAIN												
Montana	1	0	0	4	4	6	0	0	0	1	1	0
Idaho	0	0	0	6	0	2	0	0	0	0	0	0
Wyoming	0	0	0	2	7	1	0	0	0	0	1	0
Colorado	0	5	0	9	23	9	0	0	0	1	1	3
New Mexico	0	2	1	7	0	1	0	1	0	0	5	3
Arizona	0	4	0	11	8	4	0	3	1	0	3	2
Utah[1]	0	0	0	12	7	6	0	0	0	0	0	1
Nevada	0	0	0	1	0	0	0	0	0	0	0	0
PACIFIC												
Washington	1	2	0	45	18	11	0	0	0	2	0	1
Oregon	6	3	2	4	6	4	0	0	0	2	1	2
California	11	111	15	87	99	42	0	0	0	6	4	6
Total	568	329	137	812	807	807	5	12	13	184	264	308
29 weeks	2,324	1,955	1,148	144,569	94,785	94,785	283	506	1,159	2,585	2,424	3,277

[1] Period ended earlier than Saturday.

[3] Including paratyphoid fever cases reported separately, as follows New Hampshire 1, Massachusetts 3, Ohio 1, Illinois 1, South Carolina 2, Georgia 7, Florida 2, Tennessee 1, Arkansas 3, Texas 1, California 2.

Telegraphic morbidity reports from State health officers for the week ended July 22, 1944, and comparison with corresponding week of 1943, and 5-year median—Con.

Division and State	Whooping cough: Week ended—July 22, 1944	Whooping cough: Week ended—July 24, 1943	Whooping cough: Median, 1939–43	Week ended July 22, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	2	64	28	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	4	0	0	0	0	0	0	0	0	0
Vermont	19	10	10	0	0	0	0	0	0	0	0	0
Massachusetts	81	66	132	0	0	23	0	0	0	0	0	0
Rhode Island	4	43	22	0	0	0	0	0	0	0	0	0
Connecticut	68	27	45	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	110	269	291	0	2	5	0	1	0	1	0	0
New Jersey	76	184	184	0	0	0	0	1	0	0	0	0
Pennsylvania	63	255	336	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	182	193	193	0	0	0	0	0	1	0	0	0
Indiana	25	61	49	0	0	0	0	0	0	1	0	0
Illinois	63	223	223	0	1	0	0	2	0	0	0	0
Michigan [2]	134	354	269	0	0	2	0	0	0	0	0	0
Wisconsin	136	304	243	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	43	85	39	0	6	0	0	0	0	0	1	0
Iowa	14	47	33	0	0	0	0	1	0	0	0	0
Missouri	44	36	49	0	0	0	0	0	0	2	0	0
North Dakota	6	35	10	0	0	0	2	1	0	0	0	0
South Dakota	12	4	4	0	0	0	0	0	0	0	0	0
Nebraska	10	9	9	0	0	0	0	0	0	0	0	0
Kansas	59	58	53	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	0	3	0	0	0	0	0	0	0	0	0
Maryland [2]	128	112	103	0	0	0	4	2	0	5	0	0
District of Columbia	2	54	21	0	0	0	0	0	0	0	0	0
Virginia	52	103	101	0	1	0	293	0	0	5	1	0
West Virginia	32	71	29	0	0	0	0	0	0	1	0	0
North Carolina	199	268	239	0	0	0	0	0	0	5	0	0
South Carolina	106	131	49	0	0	41	0	0	0	0	0	3
Georgia	22	38	40	0	0	11	[4] 0	0	0	0	0	48
Florida	34	12	12	0	4	1	0	[illegible]	0	0	0	23
EAST SOUTH CENTRAL												
Kentucky	82	57	57	0	0	3	0	0	0	2	0	0
Tennessee	33	66	48	0	0	0	15	0	0	1	3	1
Alabama	31	54	27	0	0	0	0	0	0	0	0	51
Mississippi [2]	-			0	0	0	0	0	0	0	0	5
WEST SOUTH CENTRAL												
Arkansas	22	25	25	0	1	65	0	0	0	0	5	0
Louisiana	0	7	11	0	4	26	0	0	0	0	2	6
Oklahoma	5	18	18	0	0	0	0	0	0	2	0	0
Texas	231	336	190	0	33	523	0	0	0	0	1	48
MOUNTAIN												
Montana	9	36	27	0	0	0	0	0	0	0	0	0
Idaho	0	5	5	0	0	0	0	0	0	0	0	0
Wyoming	1	4	6	0	0	0	0	0	0	0	1	0
Colorado	21	9	15	0	0	0	0	0	0	0	0	0
New Mexico	3	4	19	0	0	0	0	0	0	0	0	0
Arizona	19	30	17	0	0	0	34	0	0	0	0	0
Utah [2]	76	66	66	0	0	0	0	0	0	0	0	0
Nevada	1		0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	32	70	49	0	1	0	0	0	0	0	0	
Oregon	10	56	23	0	0	0	0	0	0	0	0	0
California	81	242	242	0	2	[illegible]	0	6	0	0	0	0
Total	2,384	4,191	4,061	0	55	702	348	15	1	25	14	185
Same week 1943	4,191			0	106	619	487	13	1	35	16	131
Same week 1942	3,439			1	31	341	256	12	0	33	21	141
29 weeks 1944	54,263			23	906	11,335	[4] 3,951	323	16	262	344	1,828
29 weeks 1943	118,067			37	1,154	8,128	3,099	336	17	256	534	1,638
29 weeks 1942	109,174		[5] 113,405	51	581	4,380	2,924	258	32	[5] 277	574	[5] 1,078

[2] Period ended earlier than Saturday.
[4] Corrected report. Diagnosis was changed in 67 cases reported in Georgia for the week ended June 24 as dysentery, unspecified.
[5] Five-year median 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 8, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	--	0	8	0	1	0	2	0	0	0
New Hampshire												
Concord	0	0	--	0	2	0	0	0	0	0	0	0
Massachusetts												
Boston	1	0		0	95	1	10	0	29	0	1	9
Fall River	0	0		0	2	0	0	0	0	0	0	0
Springfield	0	0	--	0	9	0	0	1	7	0	0	9
Worcester	0	0	--	0	2	0	10	0	3	0	0	4
Rhode Island												
Providence	1	0	--	0	12	0	1	1	1	0	0	2
Connecticut												
Bridgeport	0	0	--	0	0	0	2	0	2	0	0	2
Hartford	0	0	--	0	10	0	2	0	5	0	1	0
New Haven	0	0		0	4	0	0	0	1	0	0	8
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	1	3	3	3	2	0	0	6
New York	1	0	1	1	72	9	35	6	51	0	4	24
Rochester	0	0	--	0	64	1	4	0	0	0	1	1
Syracuse	0	0		0	2	0	1	0	0	0	0	7
New Jersey												
Camden	0	0	--	0	0	1	0	0	1	0	0	0
Newark	0	0	--	0	21	3	2	0	4	0	1	4
Trenton	0	0		0	0	0	0	0	0	0	0	1
Pennsylvania												
Philadelphia	1	0	--	0	19	7	8	0	33	0	0	12
Pittsburgh	0	0	1	1	0	6	4	14	7	0	0	10
Reading	0	0	--	0	0	0	0	0	1	0	0	2
EAST NORTH CENTRAL												
Ohio												
Cincinnati	1	0	--	0	4	4	3	2	10	0	0	8
Cleveland	1	0	--	0	1	2	2	0	10	0	0	22
Columbus	0	0	--	0	0	0	0	0	0	0	0	11
Indiana												
Fort Wayne	0	0	--	0	0	0	3	0	0	0	0	0
Indianapolis	2	0	--	0	10	1	7	0	1	0	0	11
South Bend	0	0	--	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	--	0	0	0	0	0	0	0	0	1
Illinois												
Chicago	2	0		0	45	1	11	4	23	0	0	25
Springfield	0	0	--	0	0	0	1	0	0	0	0	0
Michigan												
Detroit	4	0	--	2	47	4	4	5	13	0	1	38
Flint	0	0	--	0	0	0	0	0	0	0	0	0
Grand Rapids	0	0	--	1	0	0	1	0	1	0	0	1
Wisconsin:												
Kenosha	0	0	--	0	13	1	0	0	0	0	0	26
Milwaukee	0	0	--	0	70	1	5	1	10	0	0	15
Racine	0	0	--	0	42	0	0	0	1	0	0	6
Superior	0	0	--	0	1	0	0	0	3	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	--	0	36	0	1	0	6	0	0	0
Minneapolis	3	0	--	0	5	0	3	1	4	0	0	0
St Paul	0	0	--	0	2	1	3	2	1	0	0	11
Missouri												
Kansas City	0	0	--	0	4	3	3	0	2	0	0	1
St Joseph	0	0	--	0	0	0	0	0	0	0	0	1
St. Louis	0	0	--	0	3	2	6	0	2	0	0	23
North Dakota												
Fargo	0	0	--	0	0	0	1	1	1	0	0	0

City reports for week ended July 8, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	2	0		0	4	0	1	1	4	0	0	0
Kansas:												
Topeka	0	0		0	5	0	1	0	1	0	1	3
Wichita	0	0		0	0	0	4	0	0	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	3	0	1	0	0	1
Maryland:												
Baltimore	4	0	1	1	10	4	8	0	8	0	0	76
Cumberland	0	0	0	0	0	0	0	0	1	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	1	0	28	2	4	0	2	0	0	1
Virginia:												
Lynchburg	0	0		0	2	0	0	2	0	0	1	1
Richmond	0	0		0	3	1	1	0	3	0	0	0
Roanoke	0	0		0	1	0	0	1	0	0	0	6
West Virginia:												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	3	0	0	0	0	0	0	4
Wilmington	0	0		0	0	0	1	1	1	0	0	18
Winston-Salem	0	0	1	0	3	0	0	4	0	0	0	1
South Carolina:												
Charleston	0	0		0	0	2	5	0	0	0	1	0
Georgia:												
Atlanta	1	0	2	0	3	0	1	0	1	0	0	0
Brunswick	0	0		0	0	0	0	0	0	0	0	0
Savannah	0	0		0	0	0	1	1	1	0	0	0
Florida:												
Tampa	0	0		0	1	0	0	1	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0		0	2	0	3	0	2	0	1	22
Nashville	0	0		0	3	1	2	0	0	0	1	3
Alabama:												
Birmingham	0	0		0	2	1	1	0	0	0	0	1
Mobile	0	0	1	0	0	0	1	1	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	1	0	0	0	0	0	0	0
Louisiana:												
Shreveport	0	0		0	0	0	3	0	0	0	5	0
Texas:												
Dallas	3	0		0	3	0	1	0	0	0	0	12
Houston	2	0		0	1	0	7	0	1	0	1	0
San Antonio	0	0		0	0	0	4	0	0	0	0	0
MOUNTAIN												
Montana:												
Billings	1	0		0	0	0	0	0	0	0	0	1
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	0
Missoula	0	0		0	2	0	0	0	1	0	1	0
Idaho:												
Boise	0	0		0	0	0	0	0	1	0	0	1
Colorado:												
Denver	8	0		0	2	0	3	1	4	0	0	7
Pueblo	0	0		0	2	0	0	0	0	0	0	2
Utah:												
Salt Lake City	0	0		0	20	0	1	0	4	0	0	17

City reports for week ended July 8, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington												
Seattle	1	0		0	12	0	2	1	5	0	0	0
Spokane	0	0		0	5	0	1	0	14	0	0	2
Tacoma	0	0		0	4		0	0	10	0	0	1
California												
Los Angeles	3	0	2	0	97	3	2	1	24	0	0	12
Sacramento	1	0		0	22	3	3	0	13	0	0	3
San Francisco	2	0		0	67	1	5	0	27	0	1	0
Total	41	0	10	6	914	69	208	56	367	0	22	490
Corresponding week, 1943	43		22	6	2,107		226		345	0	10	1,069
Average, 1939-43	49		31	[1] 9	[2] 1,936		[1] 233		411	1	28	1 233

[1] 3-year average, 1941-43
[2] 5-year median

Dysentery, amebic—Cases Chicago, 2, St Louis, 1, Baltimore 1

Dysentery, bacillary—Cases Buffalo, 5, New York, 1, Detroit 2, Charleston, 52, Nashville, 4, Shreveport, 4, Houston, 3, Los Angeles, 6

Dysentery, unspecified—Cases Shreveport, 1

Rocky Mountain spotted fever—Cases Boise, 1

Tularemia—Cases Duluth, 1, Nashville, 1

Typhus fever, endemic—Cases Rochester 1, Winston Salem, 1, Savannah, 1 Tampa, 1 Birmingham, 1, Shreveport, 1, Houston, 1, San Antonio, 1

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 33,785,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis meningococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5 3	0 0	0 0	0 0	378	2 6	70 9	5 3	131	0 0	5 3	76
Middle Atlantic	0 9	0 0	0 9	0 9	83	13 9	26 4	10 6	46	0 0	2 8	28
East North Central	6 1	0 0	0 0	1 8	142	8 5	22 5	7 3	44	0 0	0 6	100
West North Central	9 9	0 0	0 0	0 0	117	11 9	45 8	9 9	42	0 0	2 0	88
South Atlantic	8 2	0 0	8 2	1 6	88	14 7	40 9	16 3	31	0 0	3 3	177
East South Central	5 9	0 0	5 9	0 0	41	11 8	41 3	5 9	12	0 0	11 8	153
West South Central	21 4	0 0	0 0	0 0	21	0 0	64 2	0 0	4	0 0	25 7	51
Mountain	31 8	0 0	0 0	0 0	207	0 0	31 8	7.9	79	0 0	7 9	222
Pacific	11 1	0 0	3 2	0 0	327	11 1	20 6	3 2	147	0 0	1 6	28
Total	6 3	0 0	1 5	0 9	141	10 7	32 2	8 7	57	0 0	3 4	76

PLAGUE INFECTION IN BACA AND BENT COUNTIES, COLO.

Plague infection has been reported proved in a pool of 642 fleas from 81 prairie dogs, *Cynomys* sp., collected June 20 at a location in Bent County 3 miles west and 1 mile north of Deora, Colo , and in a pool of 157 fleas from 55 prairie dogs, *Cynomys* sp , collected on June 27 on a ranch in Baca County located 11 miles west and 7 miles north of Pritchett, Colo.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Honolulu—Dengue fever.—For the period June 16–30, 1944, only 1 case of dengue fever was reported in Honolulu, bringing the total number of cases reported since the beginning of the outbreak to 1,496.

Panama Canal Zone

Notifiable diseases—May 1944.—During the month of May 1944, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Diseases	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	7		2		17				26	--
Diphtheria	3						2		5	
Dysentery (amebic)			1				7		8	
Dysentery (bacillary)	3						1		4	
Malaria [1]	16	1			123		79	3	218	4
Measles	1				31				32	
Meningitis, meningococcus					1				1	
Mumps	3				8		2		13	
Paratyphoid fever	1						1		2	
Pneumonia		12		2	57			1	[2] 57	15
Relapsing fever							2		2	
Tuberculosis		27		6	7	3		5	[2] 7	41
Typhoid fever							2	1	2	1
Whooping cough					7				[2] 7	

[1] 32 recurrent cases.
[2] In the Canal Zone only.

* * *

DEATHS DURING WEEK ENDED JULY 15, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 15, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8,845	8,151
Average for 3 prior years	7,849	
Total deaths, first 28 weeks of year	264,129	269,954
Deaths under 1 year of age	616	617
Average for 3 prior years	562	
Deaths under 1 year of age, first 28 weeks of year	17,383	18,921
Data from industrial insurance companies:		
Policies in force	66,661,607	65,632,398
Number of death claims	11,148	12,251
Death claims per 1,000 policies in force, annual rate	8.7	9.7
Death claims per 1,000 policies, first 28 weeks of year, annual rate	10.4	10.2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 24, 1944.—During the week ended June 24, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		55		203	202	52	23	71	120	726
Diphtheria		4	3	22		4				33
Dysentery (bacillary)				5						5
German measles		7		44	32	3	29	10	52	177
Influenza		4			6				1	11
Measles		14	6	177	304	109	66	70	24	770
Meningitis, meningococcus		1		2	2				1	6
Mumps		5	1	160	164	11	14	36	5	396
Scarlet fever		7	11	100	117	15	7	54	48	359
Tuberculosis (all forms)		5		258	44	17	1	12	35	372
Typhoid and paratyphoid fever				12	1				1	14
Undulant fever				9	1				1	11
Whooping cough		39	1	66	24	4	1	11	26	172

CUBA

Habana—Communicable diseases—4 weeks ended June 24, 1944.—During the 4 weeks ended June 24, 1944, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	24	2	Poliomyelitis	1	
Malaria	1		Tuberculosis	4	2
Measles	8		Typhoid fever	25	5

JAMAICA

Notifiable diseases—4 weeks ended July 1, 1944.—During the 4 weeks ended July 1, 1944, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	11	53	Puerperal fever		1
Diphtheria	5	2	Scarlet fever	1	
Dysentery	2	5	Tuberculosis	41	58
Erysipelas		2	Typhoid fever	10	63
Leprosy		3	Typhus fever	10	1

NEW ZEALAND

Notifiable diseases—4 weeks ended June 17, 1944.—During the 4 weeks ended June 17, 1944, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Puerperal fever	10	
Cerebrospinal meningitis	16	1	Scarlet fever	607	[illegible]
Diphtheria	84	6	Tetanus	1	
Dysentery (bacillary)	5		Trachoma	7	
Erysipelas	30	1	Tuberculosis (all forms)	172	6[illegible]
Influenza	3	3	Typhoid fever	6	
Malaria	6		Undulant fever	6	

SWEDEN

Notifiable diseases—May 1944.—During the month of May 1944, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	15	Poliomyelitis	43
Diphtheria	155	Scarlet fever	3,016
Carriers	136	Syphilis	128
Dysentery	4	Typhoid fever	2
Gonorrhea	1,447	Undulant fever	3
Hepatitis, epidemic	392	Weil's disease	6
Paratyphoid fever	17		

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-April 1944	May 1944	June 1944—week ended—			
				3	10	17	24
ASIA							
Ceylon	C	2					
India	C	53,392	26,045				
Calcutta	C	1,406	656	227	151	105	66
Chittagong	C	63					
Madras	C	36					
Negapatam	C	17					

PLAGUE

[C indicates cases D, deaths P, present]

Place		January–April 1944	May 1944	June 1944—week ended— 3	10	17	24
AFRICA							
Belgian Congo	C	3			1		
Plague infected rats		P					
British East Africa							
Kenya	C	1					
Uganda	C	4					
Egypt	C	339	179	24	24	23	8
Port Said	C	7	6	2	4	7	4
Suez	C	140	11		3	2	
French West Africa Dakar	C	7	8				[1] 25
Madagascar	C	63					
Morocco (French)	C	22	32				
Rhodesia northern	C	1					
Union of South Africa	C	23					
ASIA							
China Foochow	C	I					
India	C	6,432	282				
Indochina	C	30	19		1		
Palestine	C	1					
EUROPE							
Portugal Azores	C	C	1	1		1	
SOUTH AMERICA							
Bolivia							
Chuquisaca Department	C	4					
Tarija Department	C					6	
Ecuador Chimborazo Department	C	1					
Peru							
Ancash Department [2]	C	3					
Libertad Department	C	5					
Lima Department	C	17					
Piura Department	C	1					
OCEANIA							
Hawaii Territory							
Hamakua District	D	[3] 4					
Plague infected rats [4]		[5] 41	1				

[1] For the period June 4 28 1944

[2] It is reported that up to the middle of June 1944, approximately 60 cases of plague with 4 deaths have occurred in Ancash Department, Peru

[3] Includes 1 death from pneumonic plague

[4] 53 fleas were also proved positive for plague on March 7 1944

[5] Includes 12 plague infected mice

SMALLPOX

[C indicates cases P present]

AFRICA							
Algeria	C	454	141				
Angola	C	20					
Basutoland	C	130					
Belgian Congo	C	918	75	32			
British East Africa							
Kenya	C	2 192	291	46	35	33	
Mombasa	C	126	9	3	2		2
Tanganyika	C	743	244	173			
Uganda	C	1 513	361		117		
Cameroon (French)	C	333	15				
Dahomey	C	44	15				
Egypt	C	7 135	1 733	210	258		
French Equatorial Africa	C	657					
French Guinea	C	369	57		117		
French West Africa Dakar	C	4	7		7		
Gambia	C	13					
Gold Coast	C	5					
Ivory Coast	C	339	46				
Morocco (French)	C	576	16				
Mozambique	C	1					
Nigeria	C	2,091	529	138	121	62	
Niger Territory	C	456	62		8		
Senegal	C	85	23		11		
Sierra Leone	C	90					
Sudan (French)	C	1,700	81		4		
Tunisia	C	5					
Union of South Africa	C	27	25	8	15	2	

SMALLPOX—Continued

[C indicates cases; P, present]

Place		January-April 1944	May 1944	June 1944—week ended— 3	10	17	24
ASIA							
Arabia	C	[1] 9					
Ceylon	C	8					
China: Kunming (Yunnan Fu)	C	25	15	3			
India	C	146,137	31,025				
Indochina	C	1,265	116		52		
Iran	C	1					
Iraq	C	27			1	3	
Palestine	C	55	30	12	7	8	5
Syria and Lebanon	C	165	5				
EUROPE							
Gibraltar	C	P					
Great Britain:							
Birkenhead	C		1				
London	C	[2] 13					1
Greece: Hevros Department	C	222					
Portugal	C	13	1	1	3	7	2
Spain	C	121	8				
Turkey	C	5,311					
NORTH AMERICA							
Guatemala	C	1					
Honduras	C	6	1				
Mexico	C	1,200					
SOUTH AMERICA							
Bolivia	C	162	75				
Brazil	C	33	28	12	14		
Colombia	C	148	61				18
Ecuador	C	4					
Peru	C	130					
Lima	C	19					
Venezuela	C	77	66				

[1] Includes 4 imported cases.
[2] Includes 1 imported case from the Middle East.

TYPHUS FEVER

[C indicates cases]

AFRICA							
Algeria	C	491	234				
Basutoland	C	4					
Belgian Congo	C	6	1				
British East Africa: Kenya	C	5	2				
Egypt	C	9,344	2,953	657	623		
French West Africa. Dakar	C	11	4				
Morocco (French)	C	1,160	448				
Morocco (Spanish)	C	5					
Mozambique	C	2					
Nigeria	C	2					
Rhodesia, northern	C	17					
Tunisia	C	364	156				
Union of South Africa	C	3,678	206				
ASIA							
Arabia. Western Aden Protectorate	C	[1] 15					
China: Kunming (Yunnan Fu)	C	24	15	1			5
India	C	3					
Indochina	C	586	281				
Iran	C	4,045	1,202				
Iraq	C	294	202	13	27		
Palestine	C	277	80	6	8	10	5
Syria and Lebanon	C	351	38	10	14		
Trans-Jordan	C	24					
EUROPE							
Belgium	C		8				
Bulgaria	C	624					
France	C	5	1				
Greece	C	146					

[1] A report dated Mar. 30, 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia.

TYPHUS FEVER—Continued

[C indicates cases]

Place		January-April 1944	May 1944	June 1944—week ended— 3	10	17	24
Hungary	C	1,582	649			[2] 405	
Irish Free State	C	1	2	1	1		1
Netherlands	C	7					
Portugal	C	1				1	
Rumania	C	5,058					
Slovakia	C	238	62	[3] 9			
Spain	C	308	50				
Turkey	C	1,585	391				
Yugoslavia	C	2,553	[4] 1,212				
NORTH AMERICA [5]							
Costa Rica	C		2				
Dominican Republic	C		4	2	3	1	
Guatemala	C	996	198				
Jamaica	C	12	14	4	4		5
Mexico	C	811					
Panama Canal Zone	C	1					
Puerto Rico (endemic)	C	33	21	4			20
Salvador	C	3					
Virgin Islands	C	2					
SOUTH AMERICA							
Bolivia	C	39	30				
Brazil	C		1				
Chile	C	134	32	10	4	4	
Colombia	C					[6] 104	
Curacao	C	1					
Ecuador	C	134					
Peru	C	175					
Venezuela	C	28	6				
OCEANIA							
Australia	C	74	17	2	5	3	2
Hawaii Territory	C	26	2	2	2		2

[2] For 3 weeks.
[3] For 2 weeks.
[4] For the period Apr. 15–May 7, 1944.
[5] Cases of typhus fever listed in this area are probably of endemic type.
[6] For the period Mar. 31–June 15, 1944.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-April 1944	May 1944	June 1944—week ended— 3	10	17	24
AFRICA							
Belgian Congo:							
Babeyru	D	1					
Bondo	D	1					
Leopoldville	C	1					
Gold Coast:							
Kintampo	C			1			
Tamale	C	[1] 1					
EUROPE							
Portugal. Lisbon.[2]							
SOUTH AMERICA							
Bolivia:							
La Paz Department	C		1				
Santa Cruz Department	C		3				
Brazil:							
Acre Territory	D	1					
Matto Grosso State	D	3					
Colombia:							
Boyaca Department	D	2					
Caldas Department	D	1					
Cundinamarca Department	D	1					
Santander Department	D	4					

[1] Suspected.
[2] According to information dated Jan. 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board.

COURT DECISION ON PUBLIC HEALTH

City health commissioner held to be an employee.—(Ohio Suprei Court; *Scofield* v. *Strain, Mayor, et al., State ex rel. Reilly* v. *Hamrock*, *Mayor, et al.*, 51 N.E.2d 1012; decided December 8, 1943.) In two cases before the Supreme Court of Ohio the appellant in each case contended that, as health commissioner of a city health district under employment by the board of health, he was not a public officer but was an employee and was therefore within the provisions of section 486–19 of the General Code, as amended, effective September 4, 1941, which read as follows: "Present employees of city health districts and city health departments shall continue to hold their positions until removed in accordance with the civil service laws."

The primary question presented was whether the position of city health commissioner was an office or an employment and whether the occupant thereof was an officer or an employee. The court reviewed the general principles which were pertinent in determining whether or not a position was a public office and also detailed some of the relevant statutory provisions on public health, among them being the one declaring that "in any city health district, the board of health or person or persons performing the duties of a board of health shall appoint for whole or part time service a health commissioner and may appoint such public health nurses, clerks, physicians, and other persons as they deem necessary." It was to be observed, said the court, that the authority for the appointment of a health commissioner was precisely the same as for the appointment of nurses, physicians, guards, and other employees and that all were under the direction, supervision, and control of the board of health. The court took the view that the application of the general principles enumerated by it warranted the conclusion that a health commissioner appointed by the board of health of a city health district was not an officer but was an employee of the board of health and that the position therefore came within the provisions of the above-quoted section 486–19 of the General Code.

The supreme court also held that the said section 486–19 was not violative of the section of the State constitution inhibiting the passage of retroactive laws or laws impairing the obligation of contracts nor of that section of the constitution which provided as follows: "The election and appointment of all officers * * * shall be made in such manner as may be directed by law; but no appointing power shall be exercised by the General Assembly, except as prescribed in this Constitution."

July

July 28/

s held not violated by sale of raw pork containing trichinae.—Court of Appeals; *Leonardi et al.* v. *Habermann Provision Co.*, .2d 85; decided July 6, 1943.) Six plaintiffs brought separate s for damages, each claiming to have been poisoned by eating purchased from the defendant. All of the plaintiffs became ill eating sausage stated to have been made from pork shoulder chased from the defendant and all of the cases were diagnosed as chinosis. The actions were founded on the claim that the sale of esh pork in which trichinae larvae are embedded was a violation of the Ohio statutes and that such violation made the defendant guilty of negligence per se as to anyone injured by the use of such meat. One of the statutory provisions involved declared that food was adulterated if it consisted wholly or in part of a diseased, decomposed, putrid, infected, tainted, or rotten animal or vegetable substance or article, whether manufactured or not. The other statutory provision penalized the sale, offering for sale, or possession with intent to sell, of diseased, corrupted, adulterated, or unwholesome provisions without making the condition thereof known to the buyer.

The evidence showed that neither the Federal nor State governments attempted to discover the presence of trichinae larvae in meat certified as fit for human consumption. According to the Ohio Court of Appeals the facts pointed to the inescapable conclusion that dealers in meat products could not with any degree of certainty certify against the presence of trichinae in absolutely fresh pork. The court said that it had to be conceded that there was much to be said for the interpretation of the pure food statutes that they did not require the impossible of those who came within their provisions. "That the statute would have application to food products when used in a normal way is not questioned, but certainly the protection of the statute should not be extended to the attempted use of food products in unusual or abnormal ways. Pork is not intended to be consumed as food in its raw state." The conclusion was reached that the above-mentioned statutes, under a proper construction, were not violated by the selling of raw pork containing trichinae.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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HISTOPATHOLOGICAL CHANGES FOLLOWING ADMINISTRATION OF DDT[1] TO SEVERAL SPECIES OF ANIMALS

By ARTHUR A. NELSON, JOHN H. DRAIZE, GEOFFREY WOODARD, O. GARTH FITZHUGH, R. BLACKWELL SMITH, JR., and HERBERT O. CALVERY,[2] *Division of Pharmacology, Food and Drug Administration* [3]

Microscopic study was made of 117 animals given the new insecticide DDT by a variety of routes and in doses varying from those fatal in a few days to those causing no perceptible lesions after several months. The animals examined comprise 16 rabbits, 38 rats, 24 guinea pigs, 14 mice, 12 chicks, 6 dogs, 3 cows, 3 sheep, and 1 horse. Tissues routinely sectioned were lung, heart, liver, spleen, pancreas, stomach, intestines, kidney, adrenal, testis and, in inuncted animals and in animals with tremors, skin and voluntary muscle, respectively. Frequently examined were brain, spinal cord, bone, bone marrow, and gall bladder; other structures such as thyroid, parathyroid, peripheral nerves, lymph nodes, and urinary bladder were sectioned less frequently. The usual fixative was formalin and the usual stain hematoxylin-eosin; some animals were fixed in Orth's fluid and a few in Zenker's. Special stains were limited to Sudan IV on frozen sections and Perls' reaction for ferric iron in pigment. Control animals kept under the same conditions and examined concurrently were available in adequate numbers except for the cows and the horse.

METHODS AND IN VIVO EFFECTS

The details of the experimental procedures and of the effects observed in vivo will be published elsewhere, therefore only a brief statement is given here. For mixing in the diets and for administration by stomach tube DDT was dissolved in corn oil, while for inunction it was made up as a 30 percent solution in an organic solvent

[1] 2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane

[2] With the technical assistance of Charlie C Boone, Senior Medical Technician, and Helen M Leppmen, Assistant Scientific Aid

[3] A portion of the funds used in this investigation was supplied by a transfer recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Division of Pharmacology of the Food and Drug Administration

which had been previously found to be physiologically inert in the quantities used. "Daily" doses by stomach tube or capsule do not include administration on Sundays. Rats on feeding experiments were started at 3 weeks of age; animals otherwise were, in general, young adults.

The outstanding in vivo effect from doses near the limit of tolerance was the production of tremors, especially in the muscles of the extremities, varying from fine to coarse, in many instances continuing for days and even weeks, and in a few intermittently present for months. These tremors were produced in rabbits, dogs, rats, mice, and cows, also in guinea pigs of another group than that reported in this paper; it would appear that with a proper dosage they could be produced in most species of animals. In the tables the symbol +++ under "tremors" refers to severe or long continued tremors, ++ refers to slight tremor, and + refers to hyperirritability without tremor; these are only a rough approximation and are an estimate from information supplied by several observers. In general, the animals discussed in this paper either died or were sacrificed when in extremis.

As a byproduct of the investigations of DDT as an insecticide, it would seem that such an agent, capable of producing relatively chronic and severe tremors, should be a useful experimental agent for the neurophysiologist.

GROSS PATHOLOGICAL CHANGES

These were not outstanding in any of the species studied. On inuncted animals the skin showed varying amounts of scaling or hyperkeratosis, with less of roughening and brownish discoloration; these changes best seen in the rabbits were usually slight and were never more than moderate in degree. Liver damage could sometimes be suspected on gross examination from the pallor or less often darkening of the centrolobular areas. Ascites or hydrothorax was never noted. In rabbits the surfaces of a few kidneys showed slight pitting, and the surfaces of two gall bladders showed a mottled appearance, with edema in one. Pulmonary infection was noted grossly in a few animals, chiefly guinea pigs. Foci of hemorrhage in the stomach mucosa and dark brown intestinal contents were occasionally seen either separately or concurrently, most often in animals surviving but a few days. Jaundice was seen in one dog. Lessened food intake often caused slight or moderate, rarely marked, atrophy of muscles and viscera, decreased body weight, and other evidence of inanition.

MICROSCOPIC PATHOLOGICAL CHANGES

Because of the great variations in dosage and in route of administration, the significant findings in the individual rats, rabbits, guinea pigs, mice, and dogs are given in tabular form (tables 1–5). In the

TABLE 1—*Rats*

Path number	Rat number	Sex	Dosage and route of administration	Duration of experiment	Tremors	Significant pathological changes [1]
4021		M	1,500 mg/kg intraperitoneal	6 da	+++	Moderate to marked central necrosis and slight hydropic degeneration of liver slight focal necrosis of leg muscles B and C neg
4023		F	do	do	+++	Slight central necrosis and slight vacuolar degeneration of liver slight necrosis and desquamation of epithelium of renal convoluted tubules slight focal necrosis of leg muscles slight focal ulceration of gastric mucosa B and C neg
4084		F	do	do	+++	Slight to moderate central necrosis of liver, slight focal necrosis of leg muscles slight focal ulceration of gastric mucosa B neg
3891	1	M	1,200 mg/kg/da inunction	11 da	+++	Hyaline granular degeneration of epithelium of renal convoluted tubules slight central atrophy and vacuolation of liver slight focal necrosis of leg muscles (none in back muscles), spinal cord and sciatic nerve negative
3941	5	M	600 mg/kg/da inunction	3? da	+++	Marked central necrosis and slight bile duct proliferation in liver moderate hyperplastic and degenerative changes in thyroid, slight renal tubular atrophy and cast formation B and M neg
4028	8	M	300 mg/kg/da inunction	56 da	+++	Extensive central necrosis of liver, slight hyperkeratosis of skin excess of hemosiderin in splenic pulp slight excess of protein material in renal tubular lumens B, C, M all neg
4188	7	M	do	92 da	+++	Mild subacute degeneration of liver (low-grade central necrosis slight central hyperplasia, slight peripheral atrophy coarse basophilic granulation) moderate hyperkeratosis and thickening of stratum spinosum of epidermis B, C M all neg
4189	9	M	do	do	+++	As rat 7 plus small number of hyaline renal tubular casts
4186	10	M	150 mg/kg/da inunction	do	++	As rat 7 except spinal cord not examined and less hyperkeratosis
4187	11	M	do	do	++	As rat 7 except spinal cord not examined few hyaline renal tubular casts and very few atrophic tubules
3892	12	F	do	11 da	++	Slight atrophy and f[illegible] vacuolation of hepatic cells B C, M, and sciatic nerve all neg
3646	12133	M	100 mg/kg/da stomach tube	3 da		Moderate central necrosis and slight hydropic degeneration of liver, slight focal necrosis of myocardium
3659	12135	F	do	5 da		Marked focal necrosis of adrenal cortices slight hepatitis B neg
3661	12131	F	do	do	+	Colloid depletion and epithelial desquamation in thyroid B neg
3662	12134	F	do	do	+	Colloid depletion and epithelial desquamation in thyroid B neg
3893		F	75 mg/kg/da stomach tube	6 da	++	Slight to moderate vacuolation of centrolobular hepatic cells B, C, M all neg
3933		F	do	20 da	++	Slight centrolobular hyperplasia of liver with moderate degree of coarse basophilic granulation and minimal necrosis B, C, M all neg
3934		M	do	do	++	As previous rat
3935		F	do	do	++	Do
3498	1597	M	1,000 ppm in diet	4 wks		None B neg
3786	1593	M	do	18 wks	++	Moderate subacute degeneration of liver, moderate number of hyaline renal tubular casts few atrophic renal tubules
4043	1589	F	do	31 wks	+++	Slight subacute degeneration of liver B, C, M all neg
3472	4575	M	800 ppm in diet	4 da	++	Small amount of hemolytic pigment in lumen of stomach, suggestive excess of mucus in small intestine and colon M neg
3473	4571	M	do	6 da	++	As rat 4575 except muscle not sectioned
3477	4572	M	do	7 da	++	As rat 4575
3482	4574	M	do	do	++	Moderate focal necrosis of leg muscles focal hemorrhages in small intestine, stomach, and lungs
3488	4577	M	do	8 da	++	Hemolytic pigment in lumens of stomach and small intestine M neg
4074	4568	M	do	30 wks	+++	Slight focal necrosis and centrolobular hyperplasia of hepatic cells, slight bile duct proliferation M neg

See footnote at end of table

TABLE 1—*Rats*—Continued

Path. number	Rat number	Sex	Dosage and route of administration	Duration of experiment	Tremors	Significant pathological changes [1]
4150	4570	M	800 ppm in diet..	32 wks..	+++	Slight subacute degeneration of liver.
3955	1842	M	500 ppm in diet..	4 da......	++	Slight vacuolar degeneration of liver; terminal gastric hemorrhage. B, C, M all neg.
3445	1616	F	---- do...........	2 wks...	....	None.
4003	1850	M	----do..........	3 wks...	++	None certain (died of pneumonia). B, C, M all neg.
3605	1612	F	-----do....... ---	9 wks...	....	Slight centrolobular hyperplasia and peripheral atrophy of liver; (?) slight decrease in thyroid colloid. B neg.
3703	1619	M	-----do...........	13 wks..	....	Slight diffuse hyperplasia of liver; (?) few renal tubular casts.
3869	4564	M	400 ppm in diet..	18 wks..	....	Slight central necrosis of liver; focal necrosis and hemorrhage in gastric mucosa; (?) atrophy of testis.
3704	1600	F	250 ppm in diet..	14 wks..	....	None.
3476	4549	M	200 ppm in diet..	6 days	....	Small amount of hemolytic pigment in lumen of stomach; suggestive excess of mucus in small intestine and colon.
3580	4533	M	100 ppm in diet..	4 wks...	....	Focal necrosis and hemorrhage in gastric mucosa; marked erythrophagia in spleen. M neg.

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles, respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

TABLE 2.—*Rabbits*

Path. number	Rabbit number	Sex	Dosage and route of administration	Duration of experiment (days)	Tremors	Significant pathological changes [1]
3543	1520	M	1,200 mg/kg/da inunction.	6	+++	Focal necrosis, marked in leg muscles, moderate in gall bladder and stomach mucosa; slight central necrosis in liver; hyaline and fewer cellular renal tubular casts; slight focal epidermal necrosis with slight subepidermal leukocytic infiltration.
3550	1521	M	-- -do -- ---	7	+++	Slight to moderate central necrosis of liver; marked focal necrosis and edema of gall bladder; slight focal necrosis of epidermis and outer corium; excess hemosiderin in spleen; slight focal necrosis of back muscles (not psoas and leg muscles). B neg.
3552	1519	M	--- -do.--- ---	7	+++	Moderate central necrosis and slight hydropic degeneration of liver; moderate focal acute nephritis; slight focal necrosis of myocardium; slight dermatitis; slight focal encephalitis.
3544	1523	F	600 mg/kg/da inunction.	6	+++	Moderate focal acute nephritis; slight central necrosis and vacuolar degeneration of liver; skin shows slight hyperkeratosis, moderate thickening of epidermis, and slight fibroblastic proliferation in outer corium.
3555	1524	M	...do...........	8	+++	Moderate central necrosis and slight hydropic degeneration of liver; slight to moderate focal nephritis; very slight focal necrosis of psoas and leg muscles; slight hyperkeratosis of skin; slight splenitis; slight hyperplasia of bone marrow; moderate focal encephalitis; moderate colloid depletion in thyroid.
3585	1526	M	300 mg/kg/da inunction.	16	+++	Marked central necrosis and hydropic degeneration of liver; slight focal nephritis and encephalitis; moderate myeloid hyperplasia of bone marrow; excess hemosiderin in spleen and bone marrow; slight hyperkeratosis and thickening of stratum spinosum of epidermis; moderate colloid depletion in thyroid.

See footnote at end of table.

TABLE 2—*Rabbits*—Continued

Path number	Rabbit number	Sex	Dosage and route of administration	Duration of experiment (days)	Tremors	Significant pathological changes[1]
3771	1525	M	300 mg/kg/da inunction	91	+++	Moderate subacute degeneration of liver slight focal fibrosis of myocardium slight hyperplasia of bone marrow slight encephalitis skin shows moderate thickening of stratum spinosum, slight hyperkeratosis and very slight mononuclear cellular infiltration in outer corium
3457	1491	F	200 mg/kg/da inunction	6		Moderate central atrophy and slight vacuolar degeneration of liver, (?) moderate focal nephritis
3620	1530	F	150 mg/kg/da inunction	37		Moderate central necrosis of liver slight focal necrosis of back and leg muscles (none in psoas) slight focal nephritis skin shows moderate hyperkeratosis slight focal sloughing of necrotic epidermis with infiltration of subepidermal corium (?) fatty replacement of probable necrosis of inner cortex of adrenal B neg
3649	1529	M	do	54	++	Slight focal necrosis of leg muscles moderate hyperkeratosis of skin with very slight mononuclear infiltration in subepidermal corium slight encephalitis Died of pyemia secondary to abscesses of feet
3772	1528	M	do	91		Moderate subacute degeneration of liver very slight dermatitis B neg
3469	1490	F	100 mg/kg/da inunction	8		Slight atrophy and vacuolation of peripheral hepatic cells with slight centrolobular regeneration
3534	1488	F	50 mg/kg/da inunction	21		Slight hydropic degeneration of liver
3651	1	F	200 mg/kg/da stomach tube	3		Slight atrophy and fine vacuolation of hepatic cells slight hepatitis moderate focal necrosis in back muscles (slight in psoas and leg muscles) B neg
3648	3	F	do	3		Died of purulent process in thorax set up by stomach tube Part of a moderate to marked central necrosis of the liver was probably caused by the DDT
3495	773	M	260 mg single dose, tube	12		None

[1] The significance of encephalitis and nephritis are discussed in the text The [illegible] skin bone marrow, and voluntary muscle were routinely sectioned and were not affected by DDT unless so stated

TABLE 3.—*Guinea pigs*

Path. number	Pig number	Sex	Dosage and route of administration	Duration of experiment	Tremors	Significant pathological changes [1]
3966	2	M	1,200 mg/kg/da inunction.	5 da.....	+++	Slight hyperkeratosis and slight thickening of stratum spinosum of epidermis. B, C, M all neg.
4002	4	F	600 mg/kg/da inunction.	14 da. ..	++	As above. Died of pneumonia.
4077	5	M	.... do...........	35 da ...	++	As above. Died of pneumonia and purulent nephritis.
3657	2034	M	75 mg/kg/da stomach tube.	3 da	....	Probably none. B neg.
3650	2035	M	....do..........	5 da.....	....	Slight to moderate focal necrosis of liver. B neg.
3655	2032	M	- - .do	...do.....	....	Slight fatty degeneration and central atrophy of liver.
3656	2031	M	....do	...do.....	....	Slight atrophy and very slight fatty degeneration of liver; very slight focal nephritis; moderate colloid depletion in thyroid.
3658	2033	M	... .do ... -	...do.....	....	Moderate acute atrophy of testis; moderate colloid depletion in thyroid; very slight focal necrosis of leg muscles. B neg.
3496	220	F	1,000 ppm in diet.	7 da		This group of 16 guinea pigs was compared with a group of 11 kept under the same conditions for approximately the same lengths of time and examined concurrently. Our other species of animals have been in excellent condition in respect to spontaneous diseases, but both groups of guinea pigs showed roughly a 50 percent incidence of chronic abscesses, plus minor inflammatory and degenerative changes. No distinct difference in incidence or severity could be made out between treated and control animals; there was a suggestion that DDT caused a minimal amount of fatty degeneration and necrosis of the liver. Brains and leg muscles negative in 4 and 8, respectively, of the treated animals.
3523	222	F	.... do...........	10 da.....		
3567	221	M	....do...........	3 wks...		
3622	215	M	- ...do	6 wks...		
3994	213	M	- ...do	24 wks		
4041	217	F	.....do... -	25 wks..		
4042	219	M	... .do.. - ..	do		
3741	209	M	500 ppm in diet...	8 wks..		
3710	204	M	- ...do	10 wks -	-------	
3765	212	M	- ...do...........	13 wks..		
3781	207	F	- ...do...........	- do		
3890	210	M	- ...do...........	20 wks..		
3914	203	M	.....do	21 wks -		
3995	208	F	..... do..........	24 wks -		
3996	211	F	.....do - -	do -		
3905	218	F	250 ppm in diet...	19 wks..		

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

TABLE 4.—*Mice*

Path number	Mouse number	Sex	Dosage and route of administration	Duration of experiment (days)	Tremors	Significant pathological changes [1]
3667	10831	F	150 mg/kg/da stomach tube.	5	+	This group of 5 mice all showed similar lesions. There was slight or moderate central necrosis and vacuolation (probably hydropic) of the liver, with slight peripheral atrophy; the vacuolation varied from very fine to ballooning of the cells. There was also slight focal necrosis in and hemorrhage from the stomach mucosa. Brains of 4 and leg muscles of 2 of these mice were sectioned and were negative.
3666	10832	F	... do	4	++	
3663	10835	F	...do.	5	++	
3664	10834	F	... do... - ...	5	++	
3665	10833	F	....do....... ..	5	++	
3975	....	M	50 mg/kg/da stomach tube.	4	+++	Slight focal necrosis in and hemorrhage from gastric mucosa. Thyroid negative. B, C, M all neg.
3989	.....	M	50-70 mg/kg/da stomach tube.	7	+++	Slight central hyperplasia and very slight necrosis of liver. B, C, M all neg.
3990	....	M	.... do.......	7	+++	As previous mouse, except very slight focal necrosis of leg muscles.
3993	... .	M	50-80 mg/kg/da stomach tube.	8	+++	Slight central necrosis of liver, plus slight central hyperplasia and peripheral atrophy; very slight focal necrosis of leg muscles. B and C neg.
[illegible]17	.....	M	.....do....... ..	12	+++	Slight irregular hyperplasia and very slight central necrosis of liver. B, C, M all neg.
4018	....	M	.....do........	12	++	Slight central hyperplasia and peripheral atrophy of liver. B, C, M all neg.
3478	18	F	500 ppm in diet...	3	....	None. B neg.
3479	[illegible]	F	... .do........	3	....	None. B and thyroid neg.
3531	[illegible]	M	125 ppm in diet...	7	--- - --	Hemolytic pigment in colon. B neg.

[1] B, C, and M r[illegible] to brain, spinal cord, and hind leg muscles respectively. Further explanation is given in the text, where [illegible] degrees of tremors are also evaluated.

TABLE 5.—*Dogs*

Path. number	Dog number	Sex	Dosage and route of administration	Duration of experiments	Tremors	Significant pathological changes [1]
3881	82-200	F	120 mg/kg/da orally, in corn oil	13 da		Jaundice; low grade central necrosis of liver, plugging of bile canaliculi, Kupffer cell hyperplasia and erythrophagia, slight fragmentation and necrosis of gluteal muscle fibers, moderate colloid depletion in thyroid, slight splenitis B and C neg
3584	163	M	100 mg/kg/da orally, in corn oil	4 wks	+++	Moderate central necrosis (low grade) of liver, slight colloid depletion in thyroid B and M neg
3604	164	M	do	6 wks	+++	Too much post-mortem autolysis to section viscera Intercostal, abdominal, and hind leg muscles show no necrosis
4233	161	F	50 mg/kg/da orally, in corn oil	7 mos	++	Liver shows moderate fatty degeneration, low grade central necrosis, marked excess o sinusoidal macrophages filled with hemosiderin, and slight portal fibrosis, moderate hemosiderosis of spleen and kidney, marked excess of fat in renal tubular epithelium B and C neg
3468	162	F	10 mg/kg/da orally, in corn oil	3 da		Died of pneumonia no lesions attributable to DDT
3541	165	F	do	20 da		As previous dog B neg

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles respectively Further explanation is given in the text, where the degrees of tremors are also evaluated

ADDENDUM At the time of correcting proof, 6 additional dogs succumbing to DDT given in corn oil in capsules at 50 to 80 mg/kg/day for 22 to 38 days had been studied All 6 dogs showed moderate to severe necrosis of the liver Among other lesions, 5 dogs showed hemorrhages (subcutaneous, subendocardial, mucosal, etc) and 3 dogs were jaundiced

tables the animals are arranged in order of decreasing dosage and, within each level, in order of increasing length of experimental period. It should be borne in mind, however, that about four times as much DDT is required to produce a given effect by inunction as by oral administration. The chicks and the large domestic animals received more uniform treatment; findings will be summarized in the text.

The most characteristic and most frequent lesion produced by the higher dosage levels of DDT, whether the animal lived for 1 week or for several months, was a moderate degree of liver damage taking any of several forms but most commonly either that of a centrolobular necrosis or what we have called subacute degeneration. The latter tended to occur with the longer times of survival and included a factor of repair or adaptation; the centrolobular areas showed varying mixtures of a lytic type of necrosis with hypertrophy of most of the surviving cells, while the peripheries of the lobules were slightly atrophic and the intermediate zones often showed vacuolated and sometimes ballooned cells, and in a few instances cells with several nuclei. The process was rather reminiscent of human subacute degeneration of the liver, but was not as extensive or as intense. Its exact counterpart has not been seen in any other series of experimental animals studied by us. In three or four livers many of the hepatic cells showed a peculiar light and semihyaline staining of all the cytoplasm except a dark thick rim. It has been learned from Dr. R. D. Lillie of the

National Institute of Health that this process is similar to the early stages of a hyaline change in the liver cells to be reported by him, and seen in animals given DDT.

Focal necrosis of small segments of voluntary muscle was often seen with the higher dosage levels of DDT, but only rarely was more than a small percentage of the area of a given section involved. Roughly 20 percent of such animals were affected, but an accurate figure is difficult to obtain, as it would vary with the amount of muscle sectioned. In rabbits the psoas, sacrospinalis, and thigh muscles were usually sectioned; in other animals a few back muscles were sectioned in addition to the thigh muscles. As a rule the thigh muscles showed more damage than the others.

Damage to the skin in inuncted animals was essentially limited to hyperkeratosis and thickening of the stratum spinosum of slight or moderate degree, with no or very little cellular infiltration in the underlying corium. The rabbits on the higher dosage levels had in addition a slight focal epidermal necrosis with slight cellular infiltration in the subjacent corium. The solvent used for DDT inunction had been previously applied to rabbit skins and had not produced these changes.

Thyroids of rabbits and dogs were sectioned routinely. Those of the rabbits were negative except that two showed a moderate depletion of stainable colloid in the follicles. Two dogs showed about one-third and one-tenth of the follicles containing very little colloid, with the remainder essentially normal; there was also epithelial desquamation in the depleted follicles. Thyroids of four rats were examined; that of rat 12131 showed moderate colloid depletion and marked epithelial desquamation, that of rat 12134 showed these in marked and slight degree, respectively, while that of rat 5 showed colloid depletion, epithelial desquamation, and epithelial hyperplasia all present in moderate degree; rat 1612 showed questionable change. Thyroids of two guinea pigs were sectioned and both of these showed moderate depletion of colloid, while those of two mice were negative.

The aforementioned changes in the liver, voluntary muscles, thyroid, and skin have been consistent throughout the species of animals studied, with the exceptions and limitations that chicks show little or no liver damage even though physiological effects were severe, that only three species were inuncted, that the number of large domestic animals examined was small, and that thyroids were not routinely examined. In addition to these lesions the rabbits showed certain changes peculiar to them. A focal granulomatous encephalitis of mild to moderate degree and histologically identical with the "spontaneous" type caused by *Encephalitozoon cuniculi* was seen in 5 of the 9 rabbit brains sectioned. This incidence contrasts with that of 4 of 55 sectioned brains from rabbits either untreated or treated with

substances other than the above. Similarly the incidence of slight or moderate degrees of a focal nephritis similar to the "spontaneous" type produced by the same organism was much greater than in control rabbits. Parenthetically, the renal lesions from toxic agents are of two general types in our rabbits, either a diffuse and chiefly tubular damage or a focal tubular and interstitial lesion similar histologically to the "spontaneous" parasitic type. Since the lesions from DDT belong in the latter group, only a distinctly greater incidence or severity than in control animals would cause DDT to be held responsible with any certainty. Whether DDT is directly responsible or whether it allows the activation of a latent parasitic or other type of involvement is an open question The third lesion seen in rabbits and not in other species was a focal necrosis of the gall bladder in 2 of the 3 rabbits on the highest dosage level.

Hemolytic pigment in the gastrointestinal tract, with or without (some undoubtedly being missed in sectioning) the presence of small areas of necrosis and hemorrhage in the gastric mucosa, was inconstantly present, most often in rats and mice and less often in rabbits It was more common in animals found dead than in those sacrificed, and usually appeared to be a terminal phenomenon. Terminal subendocardial hemorrhages of questionable significance were seen in some of the large domestic animals. Except in rabbits, renal lesions were infrequent. One of three rats given a massive intraperitoneal dose showed slight necrosis and desquamation of the convoluted tubular epithelium. Five other rats showed small or moderate numbers of hyaline tubular casts and small or very small numbers of atrophic tubules. The mouse kidneys were negative, as were those of the large domestic animals and the chicks. Guinea pig kidneys often showed minor changes, but so did their controls, as is explained in the table. Dog 161 showed a marked excess of fat in the distal looped and other renal tubules and a moderate fatty degeneration of the liver, but there was a strong factor of inanition in this instance. Rat 12133 and rabbits 1519 and 1525 showed slight focal myocardial necrosis or (1525) fibrosis. The only adrenals involved were those of rat 12135 and rabbit 1530. Only one instance of splenitis was noted; this was slight in degree, in a rabbit. One instance of splenic erythrophagia was noted, in a rat. Testicular atrophies were infrequent and with the factor of inanition eliminated it would appear that DDT does not affect this organ. Excessive amounts of hemosiderin in the splee
bone marrow, or liver were noted in only a very few animals; t..se
included rabbits 1521 and 1526, rat 8, and dog 82–200. The ..eep
spleens contained very little hemosiderin, while those of 2 the 3
cows and of the horse contained moderate amounts; how ..r, there
were no controls for the cows and horse. Incidentally ..e kidneys
and livers of the large domestic animals all cont ..d negligible

amounts of hemosiderin. Bone marrow was routinely sectioned in the rabbits and dogs; for the smaller animals the tibia, femur, and accompanying hind leg muscles were sectioned together, so that whenever leg muscles are mentioned for these animals it should be understood that the bones and bone marrow were also sectioned. Since the latter rarely, if ever, showed any changes attributable to DDT, they are not mentioned in the tables. The two slight and one moderate hyperplasia of the rabbit marrow which are mentioned are of uncertain significance, as any group of rabbits of this size is somewhat variable in its marrow composition, more so at least than most of the other animals studied. No pancreatic lesions were seen.

In view of the severe muscular tremors following large doses of DDT, a special effort was made to get brains and spinal cords from such animals immediately after death in order to determine possible changes in the nerve cells or elsewhere. Controls for each species were given concurrent similar treatment. Over 40 spinal cords, with 20 controls, and over 60 brains were studied; each of the 9 species of animals studied was included in this group except rabbits, which have already been discussed. Most of the various animals showing tremors are included; the tremors had been present for a few days to a few weeks, and even intermittently for 3 months. Most of the spinal cords and about half of the brains had been put into formalin or Orth's fluid within a half hour after sacrificing the animal. Four levels of rat, guinea pig, and mouse brains were sectioned—medulla, pons and cerebellum, midbrain, and cerebral hemisphere through the infundibulum. More sections were taken from the brains of the larger animals. In chicks the sections included medulla, cerebellum, midbrain, optic lobes, and cerebral hemisphere through the infundibulum. Usually three or four levels of spinal cord were sectioned, with slight emphasis on the lumbar region. Nowhere could any distinct difference between test and control animals be seen. There were occasional suggestions that an edema was present, and there were occasional vague peculiarities of staining of the nerve cells that could not be listed as a diagnostic entity, but there was never distinct damage to neurons, and never gliosis or inflammatory cellular infiltration. The only exceptions, all nonsignificant, are that 1 cow, 2 of 3 test sheep, and 1 of 2 control sheep showed lymphocytic cuffing around a very few blood vessels in the white substance of the brain, while 1 test and 1 control guinea pig showed slight granulomatous encephalitis somewhat similar to that in the rabbits, and 1 mouse showed a slight lymphocytic choriomeningitis. Slight cellular infiltration of the nervous tissue adjacent to the perivascular cuffing occurred in one of the test sheep. Large peripheral nerves were sectioned for 2 rats, 3 sheep, and 1 cow and were all negative.

Lesions from inanition seen in these animals have not been included with those specifically caused by DDT. Paired feeding would be necessary for an absolute differentiation. Nevertheless, it is felt that on the basis of previous experience with animals in different stages of malnutrition the two types of lesions can be satisfactorily differentiated. Changes from malnutrition (inanition) in this series were most often not apparent histologically, and in the remaining instances were most often slight and rarely marked. They were somewhat more evident on gross examination.

CHICKENS

Twelve young chickens were examined. Beginning at 3 weeks of age they had been fed 500 or 1,000 p. p. m. of DDT in the diet for 6 to10 days (one each for 4 and 12 days). In general the chicks were hyperirritable and a few had gross tremors; all died, or were sacrificed when they appeared near death. Microscopic lesions were suprisingly infrequent; 2 chicks showed minimal focal necrosis of leg muscle fibers and 2 others showed a slight vacuolation of the liver cells. Brain and spinal cord were examined in 10 of the 12 chicks and all were normal. Four of the 6 animals surviving an experimental period of 9 to 12 days showed slight or minimal fibrotic changes in the bone of the tibia and femur, but this was attributed to the reduced dietary intake as it has been seen in other groups of chicks under such a circumstance.

LARGE DOMESTIC ANIMALS

The treatment of this group was conducted by Dr. Orr of the Bureau of Entomology and Plant Quarantine and the necropsies were done by Dr. Mott of the Bureau of Animal Industry of the Department of Agriculture. Three cows, 3 sheep, and 1 horse received 100 to 200 mg./kg./day of DDT for 3 weeks (1 week for 1 cow and 1 sheep) either mixed with the feed or in capsules when the appetite became decreased, as was usually the case. Two of the 3 cows developed slow tremors or shaking, especially in the hind legs and neck; none of the other animals of this group developed tremors. Dr. H. R. Seibold of the Bureau of Animal Industry assisted in interpreting the microscopic sections.

Lesions caused by DDT in this group were relatively slight, probably because of poor absorption of dry DDT as compared with that dissolved in corn oil. The cow showing the most marked tremors had been given 200 mg./kg./day for a week; this animal had a slight fatty degeneration of the liver, an atrophic spleen, terminal subendocardial hemorrhages, and a minimal focal necrosis of voluntary muscles. One sheep had a slight central necrosis of the liver, and a low-grade pneumonic consolidation in one lung lobe. The cow with

the less marked tremors had very slight focal necrosis of the liver, while the third had terminal subendocardial hemorrhages and a slightly atrophic spleen. The splenic atrophy is probably an indirect effect, from reduced dietary intake. No other lesions possibly attributable to DDT were noted among the 7 animals. The brain and spinal cord were examined in each instance, and the large peripheral nerves in 4 of 7 instances.

SUMMARY AND CONCLUSIONS

Microscopic examination was made of 117 animals of 9 different species after administration of DDT by inunction, by stomach tube, or by admixture in the diet. Although there were wide variations in sensitivity to the compound among the different individuals of a given species, the lesions caused were quite consistent throughout the different species.

On the higher dosage levels, with the animals surviving for 1 to several weeks, there was typically caused a moderate degree of central necrosis of the liver, or with the longer periods of survival a combination of central necrosis and reparative hypertrophy which can be labeled as a moderate subacute degeneration of the liver.

The thyroid often showed moderate colloid depletion, less often epithelial desquamation, and rarely epithelial hyperplasia.

Very slight to moderate focal necrosis of voluntary muscles occurred in about 20 percent of animals on the higher dosage levels.

Rabbits showed certain lesions not seen in the other species, a focal necrosis of the gall bladder, and an increased incidence of the "spontaneous" types of encephalitis and nephritis.

Dermatitis in inuncted animals was mild throughout except that rabbits on the highest doses showed slight focal necrosis of the epidermis.

For a given dosage level of DDT, chickens and guinea pigs showed fewer histological lesions than did the other species.

A special effort was made to determine nerve cell changes in the brain and spinal cord of animals with tremors. With routine fixation and staining (formalin and Orth's; hematoxylin-eosin) no changes could be seen that were not present in controls similarly and concurrently fixed and stained.

Rare myocardial and adrenal lesions may be of significance. DDT caused no or insignificant effects on bone marrow, bone, testis, pancreas, and spleen. Renal lesions were slight and infrequent.

Because of the tremors of long duration produced by it, DDT would appear to be a promising experimental agent for the neurophysiologist.

DIAMOND POINTS AND THE DISCARD RATE OF STEEL DENTAL BURS[1]

By Henry Klein, *Senior Dental Officer*,[2] *United States Public Health Service*

In the autumn of 1942 the civilian supply of steel dental excavating burs in the United States became restricted because of lend-lease commitments and because of the rapidly expanding requirements of the armed forces. The steel dental bur is an indispensable tool in the preparation of dental cavities for fillings. Restriction of the supply for civilian use required prompt investigation of all possible avenues for the purpose of identifying and developing other tools and adjuncts which might be of assistance in the threatening situation.

Conservation of available supplies of steel burs was immediately sought through joint action of the manufacturers, the dental profession, and the War Production Board. Three main points of attack were decided upon. First, the number of different types of burs manufactured was considerably reduced so that manpower, machine facilities, and steel supplies could be concentrated on the production of a few essential types; secondly, the resharpening of dulled burs was encouraged and the number of dentists who saved their discarded burs and had them resharpened increased tremendously; and thirdly, more and more dentists proceeded to conserve their steel burs through the use of stones and diamond points for the heavy jobs involved in cutting through tooth enamel in cavity preparation work. The steel burs were used in conjunction with the stones and points for finishing the cavities and for cutting in the relatively soft dentine.

It is the purpose of this note to report some preliminary findings on the degree to which diamond points extend the useful life of steel dental excavating burs. The findings were derived from experiments which were set up at Public Health Service dental clinics in the early spring of 1943.

The dentists on duty at the Baltimore Marine Hospital and those at the Public Health Service Dispensary, Washington, D. C., were each issued a set of steel burs and were asked to record each day (on a special form designed for the purpose) two main items of information: (a) the number of cavities prepared, and (b) the number of dental excavating burs discarded as dulled and therefore unfit for use. Whenever a bur was discarded, a fresh one was issued. The observations were collected daily over a period of approximately one month.

At the end of the first month's experiment a set of fresh steel burs and a set of diamond points were issued to each of five dentists at the Baltimore Marine Hospital. Five small points suitable for cavity

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work were included in each set. The dentists were asked to use the points for cutting through the tooth enamel. They were requested to use steel burs in conjunction with the points for work in the softer dentine. Records were made each day on the number of cavities prepared and the number of steel burs discarded as no longer fit for use. The findings of the two experiments are summarized in table 1.

TABLE 1

Experiment A—Steel burs without diamond points				Experiment B—Steel burs with diamond points			
Operator [1]	Number of steel burs discarded	Number of cavities prepared	Number of cavities prepared per bur discarded	Operator [2]	Number of steel burs discarded	Number of cavities prepared	Number of cavities prepared per bur discarded
1	46	72	1 57	2	4	77	19 25
2	76	150	1 97	8	7	95	13 57
3	9	114	12 67	9	1	66	66 00
4	14	86	6 14	3	2	53	26 50
5	16	59	3 69	4	1	56	56 00
6	58	243	4 19				
7	20	145	7 25				
All operators	239	869	3 64	All operators	15	347	23 13

[1] The same operator in the two experiments is designated by the same number, that is, operator 2 in experiment A was also operator 2 in experiment B

[2] Certain operators who were included at the start of the experiment were detailed to other stations during the progress of the study and were replaced by other dentists

The data obtained from experiment A indicate that there exists a considerable individual variation in the bur discard rate among the different operators. Thus, without diamond points, one dentist was able to prepare more than 12 cavities per discarded bur, another dentist prepared more than 7 cavities per discard, while a third dentist was able to prepare only 2 cavities per discarded bur. All the operators in experiment A averaged together more than 3 cavities per discarded bur.

On the other hand, as shown by the data from experiment B, all the dentists using diamond points in conjunction with steel burs reduced the bur discard rates very significantly. Thus, operator No. 2, using diamond points and burs, was able to prepare more than 19 cavities per discard where before, in a situation in which he used burs alone (experiment A), he prepared fewer than 2 cavities per discard. In experiment B, operator No. 3 prepared 26 cavities per discard when he used diamond points in conjunction with burs, but in experiment A, when he used burs alone, he was able to prepare fewer than 13 cavities per discarded bur.

Considered all together, the operators in experiment B prepared more than 23 cavities per discarded bur. In contrast the dentists in experiment A, using burs alone, prepared fewer than 4 cavities per discard.

Accordingly, it may be noted that when diamond points were used in conjunction with steel burs for excavating cavities, the discard rate for steel burs was reduced to one-seventh of what it was when steel burs were used alone without diamond points. This very significant saving of burs occurred within the relatively short period of approximately one month (experiment B). The diamond points were not used up. They were still in good condition at the end of the experiment.

These findings, although preliminary in character, provide sufficient information to support the view that the use of diamond points in conjunction with steel burs for cavity excavation extends the useful life of the steel burs by at least 600 percent.

Grateful acknowledgment is due William T. Wright, Assistant Surgeon General (Dental), United States Public Health Service, for making possible the collection of the observations described here. Acknowledgment is also made of the cooperation of the several dental officers who participated in the study.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

June 18–July 15, 1944

The accompanying table (table 2) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended July 15, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis rose from 198 during the preceding 4-week period to 1,100 during the 4 weeks ended July 15. While every section of the country contributed to the increase, the largest increases were reported from States in the South Atlantic, Middle Atlantic, and East South Central regions. In the South Atlantic region the number of cases was about 17 times the 1939–43 median for the corresponding 4 weeks; in the Middle Atlantic region the number (232 cases) was almost 13 times the median, and in the East South Central section the incidence (184 cases) was almost 10 times the seasonal expectancy. Minor increases were reported from 4 other regions; the number of cases was about normal in the Mountain region and in the Pacific region the number reported was only about one-half of the normal seasonal incidence. More

than 80 percent of the total cases were reported from 11 States, viz, North Carolina 283 cases, New York 161, Kentucky 140, Pennsylvania, 65, Virginia 63, Ohio and California 36 each, Louisiana 31, Illinois 29, Florida 21, and Indiana 20—a total of 885 cases. In North Carolina, where the disease first appeared in epidemic form, the number of cases dropped from 94 cases during the preceding week to 63 for the week ended July 15. For the week ended July 22, the latest date available, there were 568 cases reported, with the largest increase over the preceding week occurring in the Middle Atlantic region; 225 cases, as against 133 during the week ended July 15.

Although a seasonal rise in poliomyelitis is expected the number of cases reported for the country as a whole was the highest for this period since 1934 when approximately 1,300 cases of poliomyelitis were reported. The incidence (1,100 cases) was 1.3 times the number of cases reported for the same period in 1943 and about 3 times the 1939-43 median. Table 1 shows the reported cases in geographic areas

TABLE 1.—*Number of cases of poliomyelitis reported in each geographic area for recent weeks of 1944 with comparative data for 1943 and 1941*

Division	Week ended—							
	June				July			
	3	10	17	24	1	8	15	22
All regions:								
1944	46	41	[1] 111	126	222	290	462	568
1943	52	60	99	136	190	245	297	329
1941	20	32	26	67	79	82	187	246
New England.								
1944	4	0	1	1	1	4	8	9
1943	1	3	3	3	0	1	6	3
1941	0	3	0	2	0	0	2	0
Middle Atlantic:								
1944	11	4	4	12	33	62	125	216
1943	0	5	4	8	5	6	14	12
1941	1	4	6	2	5	8	7	17
East North Central:								
1944	5	4	3	15	10	21	58	63
1943	0	3	2	1	1	8	4	12
1941	0	5	5	11	9	6	16	13
West North Central:								
1944	1	0	2	5	7	9	8	25
1943	2	0	2	1	5	9	15	12
1941	2	1	0	3	1	2	11	7
South Atlantic:								
1944	6	3	28	50	103	123	126	128
1943	6	0	2	2	2	1	6	9
1941	5	6	5	28	40	29	70	128
East South Central:								
1944	5	9	10	22	34	37	91	90
1943	0	4	0	4	0	6	5	6
1941	2	2	3	8	16	30	57	74
West South Central:								
1944	8	10	12	15	15	17	26	18
1943	8	11	35	51	107	137	148	148
1941	3	5	1	4	6	4	10	4
Mountain:								
1944	0	1	3	3	1	6	2	1
1943	2	4	3	8	10	2	9	11
1941	0	1	0	2	4	0	0	2
Pacific:								
1944	6	10	9	3	18	11	18	18
1943	33	30	48	58	60	75	90	116
1941	7	5	6	7	7	8	14	1

[1] Includes 39 delayed cases reported in North Carolina.

during recent weeks of 1944 with corresponding data for 1943 and 1941. The year 1943 shows an epidemic increase of poliomyelitis cases in the West South Central, Mountain, and Pacific regions; in 1944 an increase has occurred in all sections except the Mountain and Pacific sections. In 1942 the number of cases of poliomyelitis was the lowest recorded in recent years. The first increase of cases in the 1941 outbreak was also reported from the South Atlantic and East South Central regions.

Meningococcus meningitis.—Continuing its seasonal decline, the number of cases of meningococcus meningitis dropped from 1,167 during the 4 weeks ended June 17 to 792 during the current 4-week period. Compared with 1943 the number of cases was about 30 percent below the number reported in the corresponding period of last year. All regions except the East South Central reported a lower incidence than in 1943. The relatively low summer incidence of meningitis would indicate that the peak of the current epidemic, which has occurred in all sections of the country, has been passed, at least in most of the geographic sections. Although the reported incidence of meningitis was less than in the corresponding period in 1943, it was still above the 1939–43 median, which is based on 3 low interepidemic and 2 epidemic years.

Scarlet fever.—For the 4 weeks ended July 15 there were 5,673 cases of scarlet fever reported, as compared with 4,445 in 1943 and a 1939–43 median of 4,732 cases. Six of the nine geographic regions reported a relatively high incidence and in 3 regions the numbers of cases were below the expected seasonal average. The excesses over the medians ranged from 20 percent in the West North Central and West South Central regions to almost 3 times the median in the Pacific section. For the country as a whole the number of cases was the highest it has been during this period since 1940 when approximately 5,700 cases were reported for these same weeks.

Rocky Mountain spotted fever.—For the 4 weeks ending July 15 there were 125 cases of Rocky Mountain spotted fever reported, as compared with 93, 78, and 83 for the corresponding period in 1943, 1942, and 1941, respectively. Of the 125 cases reported for the current period, 65 occurred in the South Atlantic region, as compared with 49 in 1943, 32 in 1942, and 17 in 1941. Nineteen cases were reported in the East South Central region, as compared with 2, 4, and 3 cases for the same period in the 3 preceding years, and the Middle Atlantic region reported 13 cases, as compared with 9, 4, and 3 in 1943, 1942, and 1941, respectively. No cases were reported from the New England and West South Central regions and in the other regions the incidence was about normal. During the current period Maryland reported 23 cases, Virginia and North Carolina 16 each, Tennessee

8, New Jersey, Kentucky, Utah, and Wyoming 6 each, Alabama, New York, and West Virginia 5 each, and 11 other States reported from 1 to 4 each. Since the beginning of the year there have been 237 cases reported, as compared with 226, 243, and 291 for the same period in the 3 preceding years.

Influenza.—The incidence of influenza during the current 4-week period was lower than during the same 4 weeks in 1943, but the number of cases (1,936) was about 15 percent above the 1939–43 median. Increases over the median were reported from the New England, East South Central, and West South Central regions; in the latter region the number of cases was almost twice the preceding 5-year median.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The number of cases of diphtheria (616) reported for the 4 weeks ended July 15 was only slightly below that reported for the corresponding period in preceding years. In 1943 there were 623 cases reported and the 1939–43 median is also 623 cases. In the Middle Atlantic and East North Central sections the incidence was considerably below the preceding 5-year medians, but in other sections the number of cases either closely approximated the median or was somewhat higher.

Measles.—The number of cases of this disease was relatively low during the 4 weeks ended July 15. A total of 21,021 cases was reported, as compared with 38,441 during the corresponding period in 1943, and a 5-year median of approximately 24,000 cases. In the West South Central and Pacific regions the numbers of cases were about twice the medians and the South Atlantic region reported a slight increase over the normal seasonal expectancy; in all other sections the incidence was comparatively low.

Smallpox.—For the current 4-week period there were 19 cases of smallpox reported, as compared with 24, 51, and 84 for the corresponding 4-week periods in 1943, 1942, and 1941, respectively. The East North Central region reported 10 cases, as compared with 5 in 1943, but the 1939–43 median for that section was 28 cases. Compared with the medians the situation was favorable in all sections of the country, and for the country as a whole the current incidence was the lowest on record for this period.

Table 2.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period June 18–July 15, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	616	623	623	1,936	2,616	1,690	21,021	38,441	23,946
New England	13	13	15	16	5	5	2,347	4,320	4,320
Middle Atlantic	64	102	102	10	23	22	3,935	12,572	6,666
East North Central	77	100	114	61	102	135	8,863	12,634	5,810
West North Central	62	38	45	8	53	42	923	2,496	1,203
South Atlantic	93	74	88	581	770	622	1,942	1,719	1,719
East South Central	45	45	46	97	65	73	238	503	503
West South Central	120	111	111	943	1,178	493	2,007	850	1,035
Mountain	42	30	47	166	204	199	603	1,071	1,071
Pacific	100	110	77	54	156	144	5,163	2,386	2,386
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	792	1,111	151	1,100	868	390	5,673	4,445	4,732
New England	42	128	11	14	10	5	643	862	507
Middle Atlantic	190	280	35	232	33	18	1,237	849	1,247
East North Central	145	176	15	104	14	33	1,412	1,059	1,601
West North Central	69	76	12	29	30	17	412	284	345
South Atlantic	121	194	47	402	11	24	457	264	266
East South Central	60	48	14	184	15	19	120	108	162
West South Central	50	56	13	73	443	43	152	154	124
Mountain	20	38	4	12	29	13	283	363	132
Pacific	95	115	12	50	283	93	957	502	356
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	19	24	84	501	618	843	8,461	16,276	15,178
New England	0	0	0	20	27	24	566	606	941
Middle Atlantic	0	0	0	34	56	74	1,011	2,841	2,841
East North Central	10	5	28	49	98	98	1,575	3,710	3,710
West North Central	3	8	26	24	20	40	648	1,160	725
South Atlantic	1	0	1	118	138	188	1,978	3,120	2,298
East South Central	0	6	11	69	99	123	690	721	581
West South Central	2	0	6	138	149	256	1,096	2,035	1,453
Mountain	1	1	8	21	12	32	490	769	769
Pacific	2	4	6	28	19	29	407	1,314	1,314

[1] Mississippi and New York excluded, New York City included
[2] Mississippi excluded

Typhoid and paratyphoid fever.—For the current period there were 501 cases of this disease reported, as compared with 618, 700, and 843 for the corresponding period in 1943, 1942, and 1941, respectively. The 1939–43 median for this period was represented by the 1941 figure (843 cases). In the New England and Pacific sections the incidence was at about the median level, but all other sections reported very appreciable decreases from the normal seasonal expectancy. For the country as a whole the current incidence was the lowest on record for this period.

Whooping cough.—The incidence of whooping cough was relatively low, 8,461 cases being reported for the current period, as compared with a median of approximately 15,000 cases for the corresponding period in 1939–43. The East South Central section reported a larger number of cases than might be expected, but in all other sections the incidence was relatively low.

MORTALITY, ALL CAUSES

For the 4 weeks ended July 15 there were 33,709 deaths from all causes reported by 93 large cities to the Bureau of the Census. The number of deaths was about 1,000 more than the average number reported for this period in the years 1941–43. For the first 3 weeks of the period the number of deaths compared favorably with the average for the same weeks in the 3 preceding years, but during the fourth week a rise occurred and the number of deaths reported was 12.7 percent more than the preceding 3-year average for the corresponding week which, however, was relatively low. A comparison by geographic regions shows that the greatest excess in the number of deaths during the 4-week period occurred in the East North Central region (8,784, as compared with an average of 7,427) with minor excesses in the New England, Middle Atlantic, East and West South Central, and Pacific regions; in the West North Central, South Atlantic, and Mountain regions the number of deaths was below the 3-year average.

INCIDENCE OF HOSPITALIZATION, JUNE 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

Item	June 1943	June 1944
1. Number of plans supplying data	68	71
2. Number of persons eligible for hospital care	10,784,904	13,584,432
3. Number of persons admitted for hospital care	103,880	134,792
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	117.2	121.1
5. Incidence per 1,000 persons, annual rate for the 12 months ending June 30	106.1	105.0

DEATHS DURING WEEK ENDED JULY 22, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 22, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	7,783	8,293
Average for 3 prior years	8,188	
Total deaths, first 29 weeks of year	271,912	278,240
Deaths under 1 year of age	618	641
Average for 3 prior years	617	
Deaths under 1 year of age, first 29 weeks of year	18,000	19,563
Data from industrial insurance companies:		
Policies in force	66,657,503	65,649,886
Number of death claims	12,127	11,736
Death claims per 1,000 policies in force, annual rate	9.5	9.3
Death claims per 1,000 policies, first 29 weeks of year, annual rate	10.3	10.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 29, 1944

Summary

For the country as a whole the incidence of poliomyelitis increased during the current week. A total of 738 cases was reported, as compared with 568 last week, 361 for the corresponding week last year, and a 5-year (1939–43) median of 177. Of the current total, 652 cases, or 88 percent, were reported in the Middle Atlantic, South Atlantic, and East Central areas. Of the 14 States reporting more than 10 cases each, only North Carolina reported a decrease. An aggregate of 566 cases, or 77 percent, was reported in 8 States, as follows (last week's figures in parentheses): New York 237 (153), Pennsylvania 64 (56), Ohio 40 (14), Indiana 20 (10), Michigan 30 (24), Virginia 39 (30), North Carolina 57 (62), Kentucky 79 (77). Maryland reported 17 cases, Illinois 15, Alabama and California 13 each, Oregon 12, and Louisiana 11.

The largest number of cases previously recorded for the corresponding week since 1916 was 598, reported in 1931. For the 4-week period ended July 29, 1944, a total of 2,056 cases was reported, as compared with 1,232 for the corresponding period last year and 1,256 in 1937, the latter being the largest number reported for the corresponding 4-week period or for the month of July in any prior year since 1916, when the total for the month was 5,829. The total to date this year is 3,060, as compared with 2,316 last year and a median of 1,325 for the corresponding periods of the past 5 years.

A total of 251 cases of endemic typhus fever was reported, as compared with 185 last week, 130 for the corresponding week last year, and 90 for the 5-year median. Of the current total, 73 cases were reported in Texas, 52 in Georgia, 51 in Alabama, 28 in Florida, and 27 in Louisiana. The total to date this year is 2,079, as compared with 1,768 last year and a 5-year median of 1,168.

A slight increase occurred in the incidence of meningococcus meningitis for the country as a whole. The largest increase was in California—from 11 cases last week to 29 for the current week. New York reported 25 cases, Pennsylvania 11, Texas 12, and Michigan 10.

Of the total of 163 cases of typhoid fever, as compared with 184 last week and a 5-year median of 272, 27 occurred in Texas, 16 in North Carolina, 11 in New York, and 10 in Georgia.

A total of 7,965 deaths was recorded in 93 large cities of the United States for the current week, as compared with 7,783 last week and a 3-year average of 8,207.

Telegraphic morbidity reports from State health officers for the week ended July 29, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943	
NEW ENGLAND												
Maine	0	1	0				10	11	23	1	3	0
New Hampshire	0	0	0				4	4	4	1	1	0
Vermont	0	0	0				4	20	32	0	2	0
Massachusetts	2	0	1				115	191	178	6	10	2
Rhode Island	1	0	0	8			11	79	31	3	1	0
Connecticut	1	0	1				17	44	46	3	0	0
MIDDLE ATLANTIC												
New York	7	3	8	[1] 2		4	190	438	355	25	36	5
New Jersey	1	1	3	2	2	2	58	345	183	8	5	0
Pennsylvania	9	7	7		2		85	57	74	11	16	2
EAST NORTH CENTRAL												
Ohio	2	3	4	1	4	4	11	210	43	4	11	1
Indiana	5	1	2		3	3	8	30	12	4	3	1
Illinois	4	8	16	3	7	6	32	168	77	8	14	1
Michigan [2]	4	6	1		1		49	354	133	10	7	1
Wisconsin	3	5	1	8	7	7	150	323	280	1	1	0
WEST NORTH CENTRAL												
Minnesota	1	4	0		2	1	13	77	19	4	1	0
Iowa	3	0	0				40	17	20	1	3	0
Missouri	3	2	2				6	20	8	6	10	1
North Dakota	0	1	3				0	79	4	0	1	0
South Dakota	2	0	1				2	21	2	0	0	0
Nebraska	7	3	1	2	1		3	7	8	1	0	0
Kansas	0	2	1			2	14	20	28	2	2	1
SOUTH ATLANTIC												
Delaware	0	1	0				0	1	2	0	2	0
Maryland [2]	1	0	1		2	2	4	43	27	5	7	2
District of Columbia	0	1	1		1		[illegible]	20	9	3	4	1
Virginia	0	3	3	32	86	45	13	39	39	4	[illegible]	1
West Virginia	0	3	3		2	3	4	5	5	3	4	2
North Carolina	10	6	7				59	22	21	4	8	0
South Carolina	3	5	4	72	131	87	[illegible]	15	12	3	3	1
Georgia	2	5	8	54	8	9	10	7	7	1	2	0
Florida	4	2	3	1	5	8	63	12	11	5	5	0
EAST SOUTH CENTRAL												
Kentucky	4	0	3				9	2	10	2	1	1
Tennessee	1	2	2	5	1	11	8	1	16	1	3	0
Alabama	[illegible]	3	4	4	39	3	13	19	19	5	2	3
Mississippi [2]	7	3	3							3	3	0
WEST SOUTH CENTRAL												
Arkansas	0	0	1	14	2	5	4	3	17	3	3	0
Louisiana	15	5	4	3	7	3	11	1	3	1	3	1
Oklahoma	4	6	2	1	[illegible]	7	5	5	8	0	0	0
Texas	29	15	19	197	187	183	88	52	52	12	3	2
MOUNTAIN												
Montana	1	2	0				1	49	16	0	1	0
Idaho	1	0	0				0	5	4	0	0	0
Wyoming	1	2	2		10	5	8	10	10	0	0	0
Colorado	4	4	10		15	14	11	17	16	0	0	0
New Mexico	1	1	1	2	2		3	3	9	1	0	0
Arizona	4	1	0	12	34	23	7	24	25	0	0	0
Utah [2]	0	0	0		1		25	19	19	0	5	0
Nevada	0	0	0				0	3	2	0	2	0
PACIFIC												
Washington	5	3	1				41	41	41	5	0	0
Oregon	5	0	0	3	4	4	17	49	49	2	1	0
California	11	8	10	7	24	24	482	201	201	29	9	4
Total	174	128	150	433	596	436	1 730	3 201	2 999	191	203	34
30 weeks	6 172	6 743	7 119	337 289	80 073	150 757	587 804	531 495	463 284	12 609	12 982	1 830

[1] New York City only

[2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended July 29 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943		July 29, 1944	July 31, 1943	
NEW ENGLAND												
Maine	0	0	0	13	7	4	0	0	0	0	1	1
New Hampshire	1	0	0	0	0	0	0	0	0	0	0	0
Vermont	0	2	0	4	0	0	0	0	0	0	1	1
Massachusetts	8	1	1	38	78	48	0	0	0	4	5	1
Rhode Island	0	1	0	1	1	1	0	0	0	0	0	0
Connecticut	3	7	1	8	16	9	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	237	10	10	80	73	72	0	0	0	11	7	10
New Jersey	3	3	3	16	13	23	0	0	0	0	3	5
Pennsylvania	64	0	4	52	36	55	0	0	0	4	7	8
EAST NORTH CENTRAL												
Ohio	40	5	5	66	50	50	0	0	0	8	24	14
Indiana	20	2	2	18	11	15	0	0	0	4	8	4
Illinois	15	6	6	31	27	55	0	0	0	3	7	13
Michigan [2]	30	8	7	33	23	50	0	0	0	1	5	5
Wisconsin	6	0	0	37	26	31	1	0	0	1	0	0
WEST NORTH CENTRAL												
Minnesota	8	2	2	30	20	18	0	0	0	1	0	0
Iowa	4	0	2	42	8	11	0	1	1	1	0	2
Missouri	0	8	2	12	8	8	0	0	0	1	3	5
North Dakota	0	0	0	4	3	2	0	0	1	1	0	0
South Dakota	0	0	0	4	2	2	1	0	0	0	0	0
Nebraska	1	0	2	[illegible]	3	3	0	0	0	0	0	0
Kansas	9	30	3	14	14	20	0	0	0	1	1	3
SOUTH ATLANTIC												
Delaware	1	0	0	1	1	2	0	0	0	0	0	0
Maryland [2]	17	1	0	13	9	9	0	0	0	0	3	3
District of Columbia	4	0	0	5	3	3	0	0	0	0	1	0
Virginia	39	3	3	20	16	11	0	0	0	2	10	10
West Virginia	5	1	1	19	13	10	0	0	0	8	3	5
North Carolina	57	1	3	11	20	14	2	0	0	16	13	7
South Carolina	2	0	2	4	0	3	0	0	0	4	10	11
Georgia	8	1	4	10	11	7	0	0	0	10	16	18
Florida	3	0	1	0	1	3	0	0	0	3	3	3
EAST SOUTH CENTRAL												
Kentucky	79	11	11	11	16	16	0	0	0	8	15	21
Tennessee	8	0	2	[illegible]	2	11	0	0	0	4	7	11
Alabama	13	2	2	0	8	11	0	0	0	6	17	9
Mississippi [2]	1	1	1	2	3	4	0	0	0	8	4	7
WEST SOUTH CENTRAL												
Arkansas	0	6	2	8	1	1	0	0	0	6	8	14
Louisiana	11	0	2	2	0	3	0	0	0	6	6	14
Oklahoma	3	30	4	2	6	6	0	0	0	4	4	9
Texas	8	105	10	23	20	14	0	0	0	27	27	42
MOUNTAIN												
Montana	1	0	0	9	4	4	0	1	0	2	2	0
Idaho	0	0	0	8	3	2	0	0	0	0	0	1
Wyoming	0	0	0	6	10	3	0	0	0	0	0	0
Colorado	0	0	0	12	15	12	0	0	1	0	5	3
New Mexico	0	1	1	2	0	2	0	0	0	0	4	4
Arizona	1	0	0	4	5	1	0	0	0	0	3	3
Utah [2]	2	3	1	6	4	4	0	0	0	0	0	1
Nevada	0	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	1	2	0	22	6	8	0	0	0	1	0	1
Oregon	12	4	1	10	6	4	0	0	0	1	2	2
California	13	104	18	94	71	45	0	0	0	6	2	8
Total	738	361	177	819	677	706	4	2	6	163	237	272
30 weeks	[4] 3 060	2 316	1 325	145, 388	95 462	95, 462	287	598	1, 164	2, 748	2, 061	3, 549

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts 4, New York 3, Minnesota 1, West Virginia 2, South Carolina 1, Georgia 1, Florida 1, California 1

[4] Cumulative figures changed by corrected reports

Telegraphic morbidity reports from State health officers for the week ended July 29, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended July 29, 1944								
	Week ended		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	July 29, 1944	July 31, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	24	18	30	0	0	0	0	0	0	0	0	0
New Hampshire	0	2	2	0	0	0	0	0	0	0	0	0
Vermont	33	23	23	0	0	0	0	0	0	0	0	0
Massachusetts	66	92	126	0	0	0	0	0	0	0	0	0
Rhode Island	6	32	26	0	0	0	0	0	0	0	0	0
Connecticut	52	25	62	0	0	2	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	174	260	321	0	1	11	0	3	0	2	0	0
New Jersey	84	169	169	0	0	0	0	0	0	0	0	0
Pennsylvania	94	254	322	0	0	0	0	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio	172	267	306	0	0	0	0	0	0	0	0	0
Indiana	9	48	48	0	0	0	0	0	0	1	0	0
Illinois	72	179	179	0	0	1	0	2	0	1	0	0
Michigan [3]	81	293	262	0	0	6	0	0	0	0	0	0
Wisconsin	135	313	212	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	29	76	53	0	0	0	0	0	0	0	1	0
Iowa	8	45	31	0	0	0	0	1	0	0	0	0
Missouri	15	46	32	0	0	0	1	0	0	0	1	0
North Dakota	10	57	17	0	0	0	0	0	0	0	0	0
South Dakota	10	5	1	0	0	0	0	0	0	0	0	0
Nebraska	29	28	19	0	0	0	0	0	0	0	0	0
Kansas	33	92	71	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	2	0	0	0	0	0	0	0	0	0
Maryland [3]	90	100	76	0	0	0	0	0	0	2	0	0
District of Columbia	0	24	17	0	0	0	0	0	0	0	0	0
Virginia	92	124	68	0	0	0	260	0	0	4	2	1
West Virginia	28	52	16	0	0	0	0	0	0	2	0	0
North Carolina	246	117	117	0	0	2	0	0	0	5	0	3
South Carolina	67	127	58	0	0	29	0	0	0	0	0	8
Georgia	13	16	16	0	3	8	0	0	0	0	2	52
Florida	18	19	19	0	4	1	0	0	1	0	0	28
EAST SOUTH CENTRAL												
Kentucky	87	28	72	0	1	0	0	0	0	0	1	0
Tennessee	34	32	65	1	0	0	4	0	0	4	1	4
Alabama	14	64	26	0	1	0	0	0	0	0	0	51
Mississippi [3]	----	----	----	0	0	0	0	0	0	0	0	3
WEST SOUTH CENTRAL												
Arkansas	14	27	23	0	0	10	0	0	0	0	2	0
Louisiana	1	5	5	0	2	2	0	0	0	1	1	27
Oklahoma	8	16	16	0	0	0	0	0	0	0	0	0
Texas	164	245	232	0	30	659	0	0	0	0	0	73
MOUNTAIN												
Montana	37	34	11	0	0	0	0	1	0	0	0	0
Idaho	1	0	6	0	0	0	0	0	0	0	0	0
Wyoming	5	0	8	0	0	0	0	0	0	0	0	0
Colorado	27	28	29	0	0	0	0	0	0	0	0	0
New Mexico	2	7	19	0	0	2	5	0	0	0	0	0
Arizona	21	10	10	0	0	0	43	0	0	0	0	0
Utah [3]	72	85	78	0	0	1	0	0	0	0	0	0
Nevada	2	3	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	30	53	36	0	0	0	0	0	0	0	0	0
Oregon	12	36	15	0	0	0	0	0	0	0	0	0
California	85	231	231	0	5	11	0	0	0	0	0	1
Total	2,301	3,807	3,759	1	48	745	313	8	1	22	11	251
Same week, 1943	3,807			0	71	558	427	18	0	21	14	130
Same week, 1942	3,698			3	44	289	397	8	0	28	17	120
30 weeks, 1944	56,564			24	954	12,080	4,264	331	17	284	355	2,079
30 weeks, 1943	121,874			37	1,225	8,686	3,526	354	17	277	548	1,768
30 weeks, 1942	112,867		[5] 117,164	54	625	4,669	3,321	266	32	[5] 305	591	[5] 1,168

[3] Period ended earlier than Saturday.
[5] 5-year median 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 15, 1944

This table lists the reports from 87 cities of more than 10 000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
NEW ENGLAND												
Maine												
Portland	0	0		0	3	1	2	0	0	0	0	0
New Hampshire												
Concord	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	2	0		0	[illegible]	2	12	0	13	0	0	22
Fall River	0	0		0	4	0	0	0	0	0	1	0
Springfield	0	0		0	2	0	0	1	3	0	0	9
Worcester	0	0		0	1	0	6	0	4	0	2	13
Rhode Island												
Providence	0	0		0	5	1	4	0	0	0	0	5
Connecticut												
Bridgeport	0	0		0	0	0	0	0	1	0	0	1
Hartford	0	0	1	0	7	0	3	0	1	0	0	[illegible]
New Haven	0	0	1	1	7	0	1	0	1	0	0	[illegible]
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	4	0	1	10	2	0	0	[illegible]
New York	5	0		1	[illegible]	15	60	16	34	0	4	[illegible]
Rochester	0	0		0	57	0	1	2	2	0	1	[illegible]
Syracuse	0	0		0	1	1	4	1	0	0	0	[illegible]
New Jersey												
Camden	0	0		0	1	0	1	0	0	0	0	[illegible]
Newark	0	0	1	0	12	0	4	0	3	0	0	[illegible]
Trenton	0	0		0	0	0	3	0	1	0	0	[illegible]
Pennsylvania												
Philadelphia	0	0		0	19	2	17		22	0	2	[illegible]
Pittsburgh	1	0	1	1	3	3	8	19	3	0	0	[illegible]
Reading	0	0		0	1	0	1	0	0	0	0	[illegible]
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		2	1	2	8	1	13	0	0	[illegible]
Cleveland	0	0		0	4	0	[illegible]	1	7	0	0	[illegible]
Columbus	0	0	1	1	0	0	1	0	1	0	0	[illegible]
Indiana												
Fort Wayne	0	0		0	0	0	1	0	0	0	0	[illegible]
Indianapolis	3	0		0	2	1	1	1	2	0	0	[illegible]
South Bend	0	0		0	0	0	0	0	0	0	0	[illegible]
Terre Haute	0	0		0	0	0	3	0	0	0	0	[illegible]
Illinois												
Chicago	2	0		0	38	9	16	3	19	0	1	[illegible]
Springfield	0	0		0	0	0	1	0	0	0	0	[illegible]
Michigan												
Detroit	2	0		0	57	2	5	9	18	0	0	[illegible]
Flint	0	0		0	3	0	2	0	0	0	0	[illegible]
Grand Rapids	0	0		0	1	0	0	0	2	0	0	[illegible]
Wisconsin												
Kenosha	0	0		0	6	0	0	0	0	0	0	[illegible]
Milwaukee	0	0		0	44	1	0	0	4	0	0	[illegible]
Racine	0	0		0	45	0	1	0	0	0	0	[illegible]
Superior	0	0		0	1	0	0	0	3	0	0	[illegible]
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	33	0	1	0	1	0	0	[illegible]
Minneapolis	0	0		0	6	1	1	1	6	0	0	[illegible]
St Paul	0	0		1	2	1	1	0	2	0	0	[illegible]
Missouri												
Kansas City	0	0		0	4	0	6	0	2	0	1	[illegible]
St Joseph	0	0		0	0	0	0	0	1	0	0	[illegible]
St Louis	2	0		0	1	6	6	1	1	0	1	[illegible]
North Dakota												
Fargo	0	0		0	1	1	1	1	1	0	0	[illegible]

City reports for week ended July 15, 1944—Continued

	Diphtheria cases	Encephalitis infectious cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska												
Omaha	0	0		0	4	1	0	0	0	0	0	0
Kansas												
Topeka	0	0		0	6	1	0	0	2	0	0	7
Wichita	0	0		0	0	0	4	1	0	0	0	4
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	1	2	0	0	0	0	0
Maryland												
Baltimore	1	0		0	16	5	2	0	20	0	0	94
Cumberland	0	0		0	0	0	1	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	1	0
District of Columbia												
Washington	0	0		0	24	2	4	0	12	0	2	5
Virginia												
Lynchburg	0	0		0	0	0	1	3	0	0	1	0
Richmond	0	0		0	0	0	0	1	0	0	0	
Roanoke	0	0		0	1	0	0	4	0	0	0	2
West Virginia												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	0
North Carolina												
Raleigh	0	0		0	1	0	0	0	0	0	1	12
Wilmington	0	0		0	0	0	1	0	0	0	0	22
Winston Salem	0	0		0	2	0	1	0	2	0	1	11
South Carolina												
Charleston	0	0		0	0	1	0	0	1	0	0	0
Georgia												
Atlanta	1	0	3	1	1	0	3	1	0	0	0	0
Brunswick	0	0		0	0	0	2	0	0	0	0	0
Savannah	0	0		0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0		0	2	0	6	1	1	0	1	19
Nashville	0	0		0	0	1	0	0	0	0	0	0
Alabama												
Birmingham	0	0		0	0	1	5	0	0	0	1	2
Mobile	0	0		0	0	0	1	0	0	0	1	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	2	0	2	0	0	0	0	4
Louisiana												
New Orleans	0	0	4	0	3	0	2	3	1	0	2	1
Shreveport	0	0		0	1	0	1	0	1	0	0	0
Texas												
Dallas	2	0		0	5	0	4	2	0	0	0	3
Houston	3	0		0	0	0	4	1	1	0	0	0
San Antonio	0	0		0	0	0	0	0	0	0	0	1
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	0	0	0	2
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	0
Missoula	1	0		0	0	0	1	0	0	0	0	0
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	2	0	2	0	1	0	3	1	12	0	0	10
Pueblo	0	0		0	0	0	0	0	1	0	0	2
Utah												
Salt Lake City	0	0		0	8	0	1	0	2	0	0	11

City reports for week ended July 15, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	0	0		0	11	0	2	1	5	0	1	2
Spokane	0	0		0	7	0	2	0	1	0	0	0
Tacoma	0	0		0	8	0	0	0	2	0	0	3
California												
Los Angeles	8	0	2	0	97	2	6	1	18	0	0	10
Sacramento	0	0		0	22	0	1	0	3	0	0	0
San Francisco	0	0	1	0	48	1	7	1	9	0	0	1
Total	40	0	17	8	754	65	259	89	268	0	25	677
Corresponding week 1943	36		29	9	1,745		236		252	0	18	1,[illegible]75
Average, 1939-43	47		32	[1] 11	[2] 1,442		[1] 238		324	1	32	1,269

[1] 3-year average, 1941-43.
[2] 5-year median.

Dysentery, amebic.—Cases: New York, 2; Philadelphia, 1; Charleston, S. C., 3; Houston, 1.
Dysentery, bacillary.—Cases: New York, 9; Detroit, 3; Charleston, S. C., 94; Los Angeles, 13.
Dysentery, unspecified.—Cases: Chicago, 1; Richmond, 2; Memphis, 1; Shreveport, 1; Houston, 1.
Rocky Mountain spotted fever.—Cases: St. Louis, 1; Richmond, 3.
Tularemia.—Cases: Nashville, 1.
Typhus fever, endemic.—Cases: Boston, 1; Atlanta, 1; Brunswick, 4; Savannah, 3; Mobile, 2; New Orleans, [illegible]; Houston, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,197,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.3	0.0	5.3	2.6	215	10.5	73.5	2.6	60	0.0	7.9	144
Middle Atlantic	2.8	0.0	0.9	0.9	71	9.7	46.3	22.2	31	0.0	3.2	49
East North Central	4.3	0.0	0.6	1.8	123	9.1	26.8	9.1	42	0.0	0.6	161
West North Central	4.0	0.0	0.0	2.0	113	21.9	39.8	8.0	32	0.0	4.0	72
South Atlantic	3.4	0.0	5.1	1.7	76	15.3	30.6	17.0	61	0.0	10.2	248
East South Central	5.9	0.0	0.0	0.0	12	11.8	70.8	5.9	6	0.0	17.7	124
West South Central	14.9	0.0	11.9	0.0	33	0.0	38.8	17.9	9	0.0	6.0	27
Mountain	23.8	0.0	15.9	0.0	71	0.0	47.7	7.9	119	0.0	0.0	199
Pacific	12.7	0.0	4.7	0.0	305	4.7	28.5	4.7	60	0.0	1.6	25
Total	5.5	0.0	2.6	1.2	115	9.9	39.6	13.6	41	0.0	3.8	104

TERRITORIES AND POSSESSIONS

Virgin Islands of the United States

Notifiable diseases—April–June 1944.—During the months of April, May, and June 1944, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	April	May	June	Disease	April	May	June
Chickenpox	4	37	10	Pellagra	1	1	
Dysentery (amebic)	1			Syphilis	15	27	10
Filariasis	9	5	16	Tetanus	1	1	
Gonorrhea	7	4	10	Tuberculosis	1	4	1
Hookworm disease	4	7	10	Typhoid fever	4		1
Malaria		1	1	Typhus fever	1		
Mumps	1						

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 1, 1944.—During the week ended July 1, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		45	1	57	271	27	25	67	51	544
Diphtheria	1	5	5	25		4				40
Dysentery (bacillary)				5						5
German measles		2		15	53	1	14	25	30	140
Influenza					6				5	11
Measles		6	2	693	371	110	38	58	55	1 333
Meningitis, meningococcus				2	4				1	7
Mumps		2		33	97	9	3	59	8	211
Poliomyelitis						2				2
Scarlet fever		8	3	7	104	32	10	31	54	249
Tuberculosis (all forms)		1	15	156	69	12	5	9	48	*315
Typhoid and paratyphoid fever				16			1			17
Undulant fever				1	1					2
Whooping cough		44		26	41	6	5	17	10	149

GREAT BRITAIN

England and Wales—Infectious diseases—4 weeks ended April 29, 1944—During the 4 weeks ended April 29, 1944, cases of certain infectious diseases were reported in England and Wales as follows

Disease	Cases	Disease	Cases
Cerebrospinal fever	320	Pneumonia	3 526
Diphtheria	2 420	Puerperal pyrexia and puerperal sepsis	617
Dysentery	851	Scarlet fever	7,330
Measles (excluding German measles)	9,760	Smallpox	2
Ophthalmia neonatorum	308	Typhoid fever	24
Paratyphoid fever	10	Whooping cough	8,141

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month

(Few reports are available from the invaded countries of Europe and other nations in war zones)

Plague

British East Africa—Uganda.—For the week ended June 24, 1944, 1 fatal case of plague was reported in Uganda, British East Africa.

Egypt.—For the week ended July 8, 1944, 1 fatal case of plague was reported in the southern area of Ismailiya, Egypt. For the week ended July 15, 1944, 5 cases of plague with 3 deaths were reported in Port Said, Egypt.

Indochina—Annam.—For the period June 11-20, 1944, 2 cases of plague were reported in Annam, Indochina.

Smallpox

British East Africa.—For the week ended June 24, 1944, 368 cases of smallpox with 2 deaths were reported in Tanganyika, and 172 cases of smallpox were reported in Uganda, British East Africa.

Indochina.—For the period June 11–20, 1944, 49 cases of smallpox were reported in Indochina, including 32 cases in Cambodia and 10 cases in Annam.

Turkey.—For the month of May 1944, 239 cases of smallpox were reported in Turkey.

Typhus fever

Algeria.—For the period June 11–20, 1944, 62 cases of typhus fever were reported in Algeria.

Indochina.—For the period June 11–20, 1944, 25 cases of typhus fever were reported in Indochina.

Spain.—For the week ended May 20, 1944, 22 cases of typhus fever were reported in Spain.

COURT DECISIONS ON PUBLIC HEALTH

Use of single-service containers for delivery of milk.—(Illinois Supreme Court; *Dean Milk Co. et al.* v. *City of Chicago et al.*, 53 N.E.2d 612; decided January 20, 1944; rehearing denied March 22, 1944.) An ordinance of the city of Chicago provided that "any milk or milk products sold in quantities of less than one gallon shall be delivered in standard milk bottles." The plaintiff companies sought to deliver milk in single-service paper containers, contending that such containers were standard milk bottles within the meaning of the ordinance. The defendants construed the ordinance to mean that a standard milk bottle was a glass bottle.

The Supreme Court of Illinois said that the question presented was the meaning of the phrase "in standard milk bottles" and what the city council intended to include within that term when the ordinance was passed in January 1935. According to the court, in the construction of an ordinance, the intent of the council which passed it was controlling and the question was as to what the words used meant to

the council using them. As stated in the opinion the evidence showed, among other things, that the milk bottle was invented and first placed on the market in 1884; that for over 60 years the term "milk bottle" had had a very definite and well-understood meaning and included, in ordinary language, a type of glass bottle of characteristic size and shape with which almost everyone was familiar; that in 1935, when the ordinance involved was enacted, milk in less than gallon quantities was delivered exclusively in such bottles and that paper cartons were not used in Chicago or its vicinity for delivering milk; and that single service paper containers came into general use for the delivery of milk about 1938. Single-service paper containers, said the court, cannot be said to have been within the contemplation and intent of the council when the ordinance was enacted. "It is inescapable that the words 'standard milk bottles' as used in this ordinance mean the familiar glass milk bottles in common usage when it was adopted and cannot be construed to include 'paper single-service containers'."

While the plaintiffs did not question the city's power in 1935 to enact the ordinance in question, they argued that the State milk pasteurization plant act of 1939 repealed by implication the authority given by prior acts, so that the ordinance, applied as the city had construed it to forbid the delivery of milk in single-service paper containers, contravened the State's public policy as established by the milk pasteurization plant act and directly conflicted with such act. This contention was based on the statute's provision recognizing the use of paper containers, namely, "Single-service containers * * * shall be manufactured and transported in a sanitary manner." The plaintiffs' position was that the quoted provision of the law permitted the use of single-service containers and took away the city's power to prohibit such use. The act, said the court, construed as a whole, recognized that single-service containers may be used in the State; and it was also stated that the State department of public health had, in accordance with power granted, established standards and requirements for the manufacture and handling of such containers. Continuing, however, the court said that there was no provision in the statute that either expressly or by implication provided that cities had to permit the use of single-service containers. "The fullest meaning that may be given section 15, items 1 and 10, of the statute is that if single-service containers are permitted to be used in a city, they shall be manufactured and transported in a sanitary manner and shall conform to certain minimum requirements to be prescribed by the department of public health." It was necessary to construe the language in connection with the saving clause which specifically reserved to cities the power "to regulate the handling, processing, labeling, sale or distribution of pasteurized milk and

pasteurized milk products." This language, in the court's view, reserved to the city "the right to regulate, in the interests of providing pure milk, that part of the milk industry which pertains to the handling, processing, labeling, sale and distribution of pasteurized milk. This would include regulation as to the container in which it was delivered." The power of the city of Chicago to prohibit the delivery of milk in single-service containers was held not to be abridged or impaired by the statute in question.

A further contention of the plaintiffs was that the ordinance, if construed to prohibit the use of single-service paper containers, was unreasonable and, therefore, void. The court reviewed the evidence bearing on the question of reasonableness and concluded that the ordinance, insofar as it prohibited the use of single-service containers, was not unreasonable and void. The court pointed out that the maintenance of a pure and wholesome milk supply was one of the principal concerns of municipal government and stated that the evidence showed some valid reasons which the city council might well consider in requiring the use of the standard milk bottle. It was at least debatable and in such a case the city council was entitled to exercise its own legislative discretion and the courts would not disturb its action. "The council is the sole judge of the necessity and wisdom of the ordinance enacted, and we are concerned only with its reasonableness."

The supreme court reversed the judgment of the lower court which had granted (a) an injunction restraining defendants from enforcing the ordinance and (b) a writ of mandamus commanding defendants to issue a permit to plaintiffs allowing them to use single-service containers.

* * *

Marijuana held synonymous with Indian hemp (cannabis sativa).—(California District Court of Appeal, 2d District, Division 2; *People* v. *Savage*, 148 P.2d 654; decided May 9, 1944.) The defendant was convicted of violating section 11160 of the California Health and Safety Code which provided, among other things, that, except as otherwise provided in the law, no person should possess a narcotic except upon a written prescription. By section 11001 of the said code "narcotics" was declared to mean any of certain specified drugs, among which was cannabis sativa. The evidence showed that the defendant stated to a police officer that he knew that a cigarette found on him contained marijuana. Also at the trial the defendant stipulated that this cigarette and two other cigarettes found on the premises contained marijuana. On appeal by the defendant the California District Court of Appeal said that the sole question necessary for it to determine was: "Is marijuana synonymous with Indian

hemp (cannabis sativa)?" This question, said the court, had to be answered in the affirmative. "Marijuana (variants: mariahuana, marajuana, maraguana, marihuana, and mariguana) is another name for Indian hemp (cannabis sativa)." Continuing, the court said: "Since defendant admitted that the cigarette found on him contained marijuana, he admitted that it contained cannabis sativa which is a narcotic referred to in sections 11160 and 11001 of the health and safety code."

The judgment of the trial court was affirmed.

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Public Health Reports

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A SIMPLIFIED PROCEDURE FOR DETECTING CROSS REACTIONS IN DIAGNOSTIC ANTIPNEUMOCOCCIC SERUM[1]

By BERNICE E. EDDY, *Bacteriologist, United States Public Health Service*

The purpose of this paper is to present a simplified procedure for detecting cross reactions in diagnostic antipneumococcic serums. Since 1939 commercial diagnostic antiserums have been tested for cross reactions with 29 to 31 of the 74 known heterologous types of pneumococci. Commercial antiserums are prepared for 32 types of pneumococci and the discovery of cross reactions, a necessary prerequisite for making the antiserums specific, is a time-consuming task. Moreover, cross reactions often exist with pneumococci of higher types and these cross reactions cannot be found with the present method of testing without more than doubling the number of slide preparations to be examined.

METHOD

Antigens for each of the 75 types of pneumococci are prepared and standardized so that the turbidity matches a standard containing 200 parts per million of silica according to the method described in an earlier report (*1*), with the following exception: The peptone solution used to dilute the antigen contains 1.43 percent of formaldehyde and is adjusted to a pH of 5.4 to 6.5.

Pneumococci suspended in a slightly acid medium, if kept in the refrigerator when not in use or in an iced container while being used, retain their capsules intact for long periods of time, often for as long as a year. After the antigens are prepared it is only necessary to check for capsular swelling with control antiserums at intervals of 2 to 4 weeks.

Equal parts, usually 2 ml. of standardized antigens for each type, are combined in 14 groups according to the types which show cross

[1] From the Biologics Control Laboratory, National Institute of Health

reactions or which are similar epidemiologically (2). The types which make up these groups are as follows:

Group No	Types
1	1, 2, 5, 6, 7, 26, 51.
2	3, 4, 8, 14, 19, 57.
3	9, 33, 49, 68.
4	10, 13, 21, 34, 69.
5	11, 16, 28, 43, 53, 72.
6	12, 25, 71.
7	15, 18, 23, 30, 44, 46, 54, 55, 56, 64.
8	17, 22, 63.
9	20, 29, 31, 35, 40, 47, 52, 61, 62, 66.
10	24, 45, 48, 50, 58, 59, 60, 65.
11	27, 32, 67.
12	36, 38, 74.
13	39, 42, 70.
14	37, 41, 73, 75.

The group antigens are centrifuged and concentrated by removing all the supernatant fluid except a volume equal to that of any single type antigen used in the group. Thus if 2 ml. of each individual type antigen are combined, all but 2 ml. of the supernatant fluid is removed. The group antigen is very turbid. For instance, a group antigen such as No. 6 is 3 times more turbid than a standardized antigen for a single type, and a group antigen such as No. 7 is 10 times more turbid. A loopful of a group antigen therefore contains approximately the same number of pneumococci of each of the types included in the group that are held by a similar loopful of a standardized antigen for a single type. The only precaution is that the group antigen must be agitated before the loop is introduced.

The details for carrying out tests for cross reactions are the same with individual type antigens or with group antigens. A small loopful (a loop of 28-gage platinum, 1 mm. inside diameter) of antigen, a large loopful (a loop of 26-gage platinum, 3–5 mm. inside diameter) or a drop of antiserum from a capillary pipette, and a small loopful of saturated aqueous methylene blue are mixed on a coverslip and the coverslip is inverted on a flat glass slide. The preparation is incubated in a moist chamber at 37° C. for 30 minutes and the pneumococci are examined under the microscope for capsular swelling.

OBSERVATIONS

In table 1 is an example of tests for cross reactions carried out with a group antigen and with antigens for the types included in the group. The cross reactions could be detected as well with the group antigen as with the antigens for the individual types and in some instances with greater ease because the pneumococci in the preparation which were not swollen served as controls.

In tables 2 and 3 are shown the results of tests carried out on 2 anti-

Table 1.—*Data illustrating that cross reactions can be detected with antigens of mixed types of pneumococci as well as with antigens of individual types*

Antipneumococcic serums		Antigens										
Type	Lot	Combined types 20, 29, 31, 35, 40, 47, 52, 61, 62, 66	Type 20	Type 29	Type 31	Type 35	Type 40	Type 47	Type 52	Type 61	Type 62	Type 66
2	B201	P	P	0	0	0	0	0	0	0	0	0
5	E501	T	0	0	0	0	0	0	0	T	T	T
15	E1501	P	T	0	0	0	0	T	T	P	P	T
18	H1802	+	0	0	0	0	0	0	T	P	0	T
19	B1903	+	T	0	+	0	T	T	0	T	P	0
22	B2201	+	0	0	+	0	0	0	0	0	0	0
32	J3202	+	0	0	+	0	P	0	0	0	0	0
34	B3401	P	0	T	0	P	0	0	T	0	0	0

The symbol + indicates that undiluted antiserum causes completely swollen pneumococcic capsules; P that in a clump of pneumococci some organisms have completely swollen capsules whereas others do not; T that there is perceptible swelling but none of the pneumococci have capsules with distinct outlines; and 0 that no capsular swelling occurs.

Table 2.—*Tabulation of the results of tests for cross reactions carried out on a type 8 antiserum with group antigens and with separate antigens for each of 74 heterologous types of pneumococci*

Group antigens			Individual type antigens		
Group No.	Capsular swelling	Number of types in group	Types	Capsular swelling	Group No. which contains type
1	0	7	1	0	
2	+	6	2	0	
3	0	4	3	+	2
4	0	5	4-7, inclusive	0	
5	0	6	9-18, inclusive	0	
6	0	3	19	+	2
7	0	10	20-75, inclusive	n	
8	0	3			
9	0	10			
10	0	8			
11	0	3			
12	0	3			
13	0	3			
14	0	4			

Table 3.—*Tabulation of the results of tests for cross reactions carried out on a type 22 antiserum with group antigens and with separate antigens for each of 74 heterologous types of pneumococci*

Group antigens			Individual type antigens		
Group No.	Capsular swelling	Number of types in group	Individual types	Capsular swelling	Group No. which contains type
1	0	7	1-20, inclusive	0	
2	0	6	21	P	4
3	0	4	23-30, inclusive	0	
4	P	5	31	+	9
5	0	6	32-35, inclusive	0	
6	0	3	36	+	12
7	0	10	37	0	
8	+	3	38	+	12
9	+	10	39-62, inclusive	0	
10	0	8	63	+	8
11	0	3	64-68, inclusive	0	
12	+	3	69	T	4
13	0	3	70-73, inclusive	0	
14	0	4	74	+	12
			75	0	

serums with antigens for 74 heterologous types of pneumococci and with 14 group antigens which include 75 types. All of the cross reactions discovered by means of separate antigens for each type were also noted with the group antigen which contained the reacting type. When no capsular swelling of any pneumococcus in a group antigen occurred, none was observed in individual antigens of the types included in the group.

DISCUSSION

The successful use of antipneumococcic serums for therapeutic purposes and the accuracy of type incidence reports are dependent upon the specificity of the diagnostic antiserums. It has been shown that cross reactions between certain types occur regularly (*2*). However, there are other cross reactions which occur infrequently but which may cause an error in type diagnosis if not detected.

The simple procedure of combining antigens of the different types of pneumococci in 14 groups makes possible the detection of cross reactions with all the known types, often through the examination of fewer slide preparations than were necessary when separate antigens for only 29 to 31 of the 74 heterologous types of pneumococci were used. For example, all of the cross reactions in the Type 8 antiserum (table 2) could have been discovered by examining 19 slide preparations, 14 prepared with group antigens plus 5 with the heterologous types of pneumococci included in Group No. 2. In the Type 22 antiserum (table 3) all of the cross reactions could have been detected by examining 34 slide preparations, 14 made with group antigens, 5 with the types of pneumococci included in Group No. 4, 2 with the heterologous types in Group No. 8, 10 with the types in Group No. 9, and 3 with the types in Group No. 12.

SUMMARY

By combining standardized antigens of the different pneumococcic types in 14 groups, cross reactions in antipneumococcic serum with any of the 74 heterologous types of pneumococci may be detected. After discovering the group for which a cross is shown, it is only necessary to test the antiserum with the separate types of pneumococci which make up the group. Since most of the types of pneumococci in the different groups show some serologic reactions in common, cross reactions with any of the known heterologous types may be detected by the examination of an antiserum with a minimum number of antigens.

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X-RAY EXPOSURE IN MANUFACTURE AND OPERATION OF CERTAIN ELECTRONIC TUBES

By A. F. BUSH, *Industrial Hygiene Engineer*, H. T. CASTBERG, M. D.[1], *Chief*, and D. G. MACPHERSON, *Medical Officer, Bureau of Industrial Health, California Department of Public Health*

The dangers of X-ray or radium-emanation exposure are well recognized and in most cases controlled in industry when it is known that they exist. When X-ray or radium is utilized for the examination of industrial products or in radium-dial painting, proper controls are used, or at least there is a recognition of the potential dangers.

Recently interest has been aroused in a possible similar hazard in the manufacture and operation of high-vacuum electronic tubes (*1*).

We were confronted with a problem of this type and found on investigation that during the manufacture, testing, and operation of such tubes, measurable amounts of potentially harmful X-rays were produced. These tubes were tested or operated at voltages above 25 kilovolts. The presence of X-rays was detected with fluoroscopic screens and measured by means of the Victoreen minometer and dental X-ray films.

A report by Daily (*1*) concluded that no harmful clinical effects resulted from exposure to a similar type of tube under normal operation. It is understood that since that report was written the voltages at which high-vacuum electronic tubes are operated have been increased, and it is believed that potential hazard now possibly exists, even under normal operating conditions.

Although these tubes are not designed for production of X-rays, they are so constructed that they have the various elements necessary for X-ray emission.

Commercial X-ray tubes are so constructed and shielded that the radiation is confined to a narrow beam. This is not true of the tubes in question and they may emit X-rays in many different directions.

TOLERANCE DOSAGE

The provisional tolerance dose for X-rays should not exceed 0.1 roentgen per day, according to the National Bureau of Standards (*2*). However, considering the long-term genetic effect on experimental animals, some authorities believe that 0.02 roentgen per day may be considered a much safer maximum dose (*3*).

[1] Passed Assistant Surgeon, U. S. Public Health Service.

MEANS OF DETECTION

For detecting and roughly measuring the exposure, dental X-ray films (Eastman Code DF11) were worn in breast pockets by workers for varying lengths of time during their routine work. These showed varying degrees of exposure at different locations. The National Bureau of Standards recommends "that each worker shall be supplied with a dental X-ray film half-covered with lead foil, which shall be worn on the breast continuously, with the film side out, for 15 working days. If, upon development, appreciable darkening of the exposed part of the film is indicated, the cause therefor shall be investigated and eliminated" (*2*).

Appreciable darkening of the films worn by several workers in this study developed within 2 days or less, thus indicating a much higher exposure to X-rays than is recommended. Several films, placed at distances of from 12 to 14 inches from the tubes, showed marked darkening in periods of 8 to 10 minutes. At one location an over-exposed roentgenogram of a finger was made with a 3-minute exposure at a distance of 10 to 12 inches from the source.

To explore the source of X-rays and to find leaks after controls had been installed, a length of cardboard mailing tube closed at one end by a diaphragm of fluorescent screen was employed. Upon peering into the light-free chamber formed by this device, the glowing of the fluorescent screen indicated activation by X-rays.

Measurement of the intensities of these exposures was made with a Victoreen minometer equipped with 0.1 roentgen and 0.01 roentgen ionization chambers.

Over a hundred tests were made with ionization chambers at exposure periods varying from 1 minute to 8 hours.

Four different operations showed evidence of X-ray exposure on dental film and were consequently checked with the minometer. The exposures of the operators at these locations were 2.5, 0.1, 0.12, and 0.1 roentgens per day, calculated on the basis of routine continuous operation. Since distance is a factor, spot checks with the minometer were made at distances of 1 to 3 feet from the source. Some of these measurements were as high as 6 to 8 roentgens per day.

At most of the locations the operators were not actually exposed to the radiation indicated by these figures because the tubes were not run continuously. However, with the anticipated increase in production, the operations will become more continuous and consequently the exposure will tend to become more significant.

In order to evaluate the possible clinical effects of these rays on the operators, hemoglobin estimations, white-cell counts, and differential white-cell counts were made on the blood of five employees who had been the most heavily exposed. Fortunately these were found to be

within normal limits. No clinical or laboratory effects from X-ray exposure were discovered.

The exact exposure of the workers in these operations is difficult to estimate, inasmuch as the operations are carried on intermittently and the workers are moved frequently from one operation to another.

A long latent period frequently elapses between the time of exposure and the first appearance of evidence of damage. Consequently, these workers cannot be considered to be free of injury until some years have passed.

CONTROL

Recommendations were made to shield the tubes with sheet lead (2 mm. thick) on the front panels of the cabinets in which the tubes are housed, with ¼-inch-thick lead glass inspection windows. The backs and bottoms of the cabinets were protected by 16-gage sheet steel. The protection afforded by the sheet steel was felt to be ample, inasmuch as it is impossible for operators or passers-by to stand close to the back of the cabinet. After this shielding had been installed, minometer tests proved that the exposure of the operators was reduced to well below the tolerance dosage of 0.1 roentgen per day.

CONCLUSIONS

High vacuum electronic tubes operating at high voltages are capable of producing X-rays well above the provisional tolerance dose of 0.1 roentgen per day.

In one industrial situation studied extensively the exposure of operators was found to be as high as 2.5 roentgens per day.

Once this hazard was recognized it was possible to reduce the intensities below the provisional tolerance dose by the use of sheet lead, sheet steel, and lead glass.

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MORBIDITY AND MORTALITY FROM SPECIFIC CAUSES DURING 1943 AND RECENT PRECEDING YEARS

I. Morbidity

The following data concerning the prevalence of nine communicable diseases are based on weekly telegraphic reports from the health officers of the various States and the District of Columbia (table 1).

Although cases of these diseases are reportable by law, there is considerable variability in the completeness of the reports. While the number of cases is smaller than the number which actually occur during any given year, it is believed that the data indicate reasonably accurate trends and reveal any unusual prevalence of a disease.

DISEASES ABOVE MEDIAN PREVALENCE

Influenza.—The number of reported cases (421,005) of influenza was about 4 times the number reported in 1942 and 2.2 times the median for the years 1938–42. An epidemic of this disease started in the Great Lakes region about the middle of November and spread rapidly into all regions of the country. With the exception of the year 1941, the reported incidence in 1943 was the highest in the 15 years for which these data are available. In 1941 there were approximately 634,000 cases reported. While the North Central and Northeastern States reported some increase in the number of cases in 1941, the epidemic of that year was most severe in the Western and Southern States. Other major epidemic years with 300,000 or more cases reported were 1940, 1937, 1932, and 1929.

Meningococcus meningitis.—This disease has been increasing since the beginning of 1941; there were 17,922 cases reported during the year 1943, as compared with 3,774 in 1942 and a 5-year median of 2,048 cases. Prior to the present epidemic of 1943–44 the country has experienced 3 Nation-wide epidemics of meningococcus meningitis in the last 30 years; the peaks for the country as a whole occurred in 1917–18, 1929–30, and 1935–37, respectively. For the country as a whole the epidemics of 1917–18 and 1929–30 were of about the same magnitude, that of 1935–37 was somewhat smaller, while the present epidemic exceeds all three in the reported number of cases. In the epidemic of 1917–18 the highest incidence rates were reported from the West North Central and South Central regions; with comparatively low rates for the Mountain and Pacific regions. In the sections where the 1917–18 epidemic was most acute (West North Central and South Central) the reported incidence in that epidemic was higher than in 1943–44. In the epidemic of 1929–30 the highest incidence rates occurred in the Mountain and Pacific sections, relatively high rates were reported in the South Central and East North Central sections, and comparatively low rates in the New England and South Atlantic sections. In the East North Central, South Central, and Mountain and Pacific sections higher case rates were reported during the peak of the 1929–30 epidemic than in 1943–44. The epidemic of 1935–37 was most severe in the South Atlantic sections; in all sections, however, fewer cases were reported during that epidemic than in the 1943–44 epidemic.

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the year 1943, the number for the year 1942, and the median number of cases reported for the years 1938–42*

Division	1943	1942	5-year median, 1938-42	1943	1942	5-year median, 1938-42	1943	1942	5-year median, 1938-42
	Diphtheria			Influenza [1]			Measles [2]		
United States	13,744	15,559	17,325	421,055	109,245	189,162	602,811	505,867	505,867
New England	271	295	296	2,750	232	457	59,461	50,328	39,353
Middle Atlantic	1,369	1,508	1,973	3,019	916	1,178	173,517	71,576	71,576
East North Central	1,921	2,048	2,433	31,283	3,677	5,212	157,668	53,712	53,712
West North Central	1,152	1,002	1,186	37,956	1,468	10,870	48,640	47,908	38,737
South Atlantic	2,873	4,128	4,783	107,611	34,373	65,481	36,921	58,865	58,865
East South Central	1,542	1,800	2,090	82,567	9,494	18,835	21,705	8,667	9,696
West South Central	2,419	3,059	3,059	97,049	43,383	43,383	22,412	51,683	21,706
Mountain	688	693	917	35,631	10,724	16,507	35,427	35,786	22,025
Pacific	1,509	966	1,134	23,189	4,978	4,978	47,060	120,842	38,398
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	17,922	3,774	2,048	12,401	4,193	7,299	140,475	126,853	155,059
New England	2,013	482	102	861	185	151	20,399	14,654	10,373
Middle Atlantic	4,427	1,068	499	982	700	700	30,044	30,356	37,295
East North Central	2,543	292	236	2,416	979	1,382	35,710	35,981	52,861
West North Central	1,149	158	132	1,547	502	502	13,666	13,531	13,531
South Atlantic	3,064	748	449	240	377	893	12,363	11,796	10,851
East South Central	1,312	253	278	253	440	380	5,188	6,706	6,706
West South Central	916	291	186	1,972	478	346	3,979	3,275	3,609
Mountain	536	94	94	965	166	166	8,483	4,147	4,457
Pacific	1,962	388	117	3,165	366	366	10,643	6,407	7,808
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	733	863	2,461	5,546	6,703	9,575	176,415	178,116	178,116
New England	0	1	0	290	276	276	12,653	21,320	16,378
Middle Atlantic	18	48	0	738	851	1,232	34,317	47,825	47,825
East North Central	320	204	546	763	798	1,046	41,024	45,670	45,688
West North Central	100	154	951	277	371	654	10,971	391	8,915
South Atlantic	46	39	46	1,130	1,587	1,949	27,596	[illegible],845	22,553
East South Central	52	105	127	758	907	1,245	7,376	6,586	6,623
West South Central	138	245	342	1,025	1,350	2,402	19,179	9,070	12,498
Mountain	34	39	309	287	308	464	6,950	6,849	8,859
Pacific	25	28	140	278	255	484	16,349	15,560	18,390

[1] Mississippi and New York excluded New York City included
[2] Mississippi excluded

The present epidemic has been severe in all sections of the country. The largest excesses over the 1938–42 median were reported from the New England and Pacific sections. In the former region the number of cases was almost 20 times the preceding 5-year median and in the Pacific region the number was almost 17 times the median. Other sections reported smaller excesses ranging from 5 times the median in the West South Central section to almost 11 times the median in the East South Central region. Preliminary reports of cases indicate that in the Central sections and possibly in the country as a whole, the peak of the current epidemic did not occur until early in 1944.

Measles.—The incidence of measles was relatively high in 1943. The number of reported cases (602,811) was about 20 percent above the number reported in 1942, which figure (505,867) also represents the 1938–42 median. The disease was most prevalent in the Middle

Atlantic and East North Central regions, but all regions except the South Atlantic showed increases over the 1938–42 medians; in the South Atlantic region the number of cases was only about 60 percent of the 5-year median.

Poliomyelitis.—The only other communicable disease more prevalent than usual during 1943 was poliomyelitis. The number of cases (12,401) was about 3 times the number reported in 1942 and 1.7 times the 1938–42 median. After a year of comparatively low incidence the number of cases of this disease began to increase early in 1943; by the middle of the year an epidemic of significant proportions was in progress, affecting practically every section of the country except the South Atlantic and East South Central. For the country as a whole the incidence was the highest since 1931, when almost 16,000 cases were reported; the epidemic of 1931 was confined largely to the New England and Middle Atlantic regions. Less severe epidemics of this disease occurred in 1927 and 1935, with the highest incidence in 1927 being reported from the Pacific region, while both the North and South Atlantic regions reported a relatively high incidence in 1935. In 1916, the only other year in which the reported cases of poliomyelitis exceeded those of 1943, there were approximately 27,000 cases in 27 States, as compared with 12,401 in all of the States in 1943.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The reported cases of diphtheria (13,744) dropped considerably below even the year 1942, during which 15,559 cases were reported. Prior to 1936 there had been no less than 30,000 cases of diphtheria reported, with incidence peaks of 204,133 cases in 1921, 166,031 cases in 1922, and 106,191 cases in 1927. With two slight interruptions, one in 1938 and the other in 1941, the disease has declined steadily since 1927 and the incidence in 1943 was about 60 percent of the average annual incidence (approximately 22,000 cases) since 1936, the first year in which fewer than 30,000 cases were reported. While the incidence has fluctuated from year to year in the various sections of the country, the general trend has been downward in all sections, the 1943 incidence in some sections being the lowest on record.

Scarlet fever.—During the year 1943 there were 140,475 cases of scarlet fever reported, as compared with 126,583 in 1942 and a 1938–42 median of about 155,000 cases. Six of the nine geographic regions reported a relatively high incidence and the other three reported fewer cases than normally occur during the year. The greatest excesses over the median were reported from the New England and Mountain regions (about 50 percent), with smaller excesses in the West North Central, South Atlantic, West South Central, and Pacific

regions. In the East North Central region where this disease has been unusually prevalent for several years, the number of cases reported during 1943 was less than 70 percent of the 5-year median and the Middle Atlantic and East South Central regions also reported a comparatively low incidence.

Smallpox.—The incidence of smallpox reached a new low level during 1943. The number of reported cases (733) was about 85 percent of the number reported in 1942 and about 30 percent of the 1938–42 median. Relative to prior years, the situation was favorable in all sections of the country except the Middle Atlantic. Sixteen of the 18 cases of smallpox reported in the Middle Atlantic region occurred in Pennsylvania and were the result of an outbreak that started in Pennsylvania in December 1942. Sixteen cases occurred in the first two weeks of January but no more were reported during the year. In the South Atlantic region the disease stood at about the normal level, but other regions, even those in which the disease is normally high, reported a low incidence. For the country as a whole the incidence of smallpox during 1943 was the lowest on record.

Typhoid and paratyphoid fever.—For the year 1943, 5,546 cases of typhoid fever were reported, as compared with 6,703 in 1942 and 9,575 for the preceding 5-year median. The incidence in the New England region was slightly above the normal level, but very significant decreases from the 1938–42 medians were reported from all other regions. For the country as a whole the incidence in 1943 was the lowest in the 15 years for which these data are available.

Whooping cough.—The number of cases (176,415) of whooping cough reported in 1943 was about 1,700 below the normal expectancy of approximately 178,000 cases. Of the various geographic regions, the West North Central, South Atlantic, and South Central reported excesses over the 1938–42 median, but in the other five sections the numbers of cases were lower than the medians.

II. Mortality

The annual mortality rates for specific causes for the past five years as shown in table 2 are based on preliminary data for 38 States and the District of Columbia. Similar mortality rates by quarters for the past three years are shown in table 3. Death rates for 40 States, the District of Columbia, Alaska, Hawaii, and the Canal Zone are presented in tables 4 and 5.

These data are made available through a cooperative arrangement with the respective States which furnish provisional tabulations of current birth and death records to the United States Public Health Service. Because of lack of uniformity in the method of classifying deaths according to cause, and the impossibility of including a certain num-

TABLE 2.—*Summary of mortality trends from certain causes in a group of 39 States,*[1] *1939–43 (estimated population July 1, 1943, 109,718,200)*

[Rates provisional for all years]

Diseases (numbers in parentheses are from the International List of Causes of Death, 1938 revision)	1943	1942	1941	1940	1939
	Rate per 1,000 population				
Deaths, all causes	10.9	10.3	10.4	10.7	10.6
Births, exclusive of stillbirths	21.3	20.6	18.5	17.5	17.1
	Rate per 1,000 live births				
Infant mortality (live births, 1943, 2,331,789)	40	40	45	46	47
Maternal mortality	2.3	2.5	3.0	3.6	3.8
	Rate per 100,000 population				
Typhoid and paratyphoid fever (1–2)	.50	.52	.79	1.03	1.54
Dysentery (27)	1.28	1.29	2.08	2 04	1.82
Diarrhea and enteritis under 2 years (119)	7.00	6.49	7.50	7.10	7.94
Appendicitis (121)	5.89	6.44	8.27	9.87	10.91
Scarlet fever (8)	.34	.33	.35	.51	.67
Diphtheria (10)	.77	.84	.90	1.02	1.52
Whooping cough (9)	2.43	1.79	2.65	1.99	2.22
Measles (35)	.94	.81	1.59	.48	.75
Cerebrospinal (meningococcus) meningitis (6)	2.15	.65	.48	.44	.47
Acute poliomyelitis and acute polioencephalitis (36)	.76	.38	.54	.70	.52
Acute infectious encephalitis (lethargic) (37)	.48	.42	.67	.52	.44
Malaria (28)	.34	.47	.64	.76	.96
Pellagra (69)	.90	.96	1.20	1.31	1.56
Tuberculosis, all forms (13–22)	41.4	41.7	43.2	44.3	45.8
Syphilis (30)	11..1	11.3	13.2	14.0	14.6
Influenza (grippe) (33)	12.8	8.0	15.9	14.7	16.4
Pneumonia, all forms (107–109)	52.5	46.3	47.8	54.3	59.7
Cancer, all forms (45–55)	125.1	122.9	120.5	119.6	117.4
Diabetes mellitus (61)	27.9	25.7	25.8	26.8	26.0
Intracranial lesions of vascular origin (83)	95.7	90.8	87.5	90.5	89.5
Diseases of the heart (90–95)	324.1	298.3	292.2	294 5	283.8
Nephritis, all forms (130–132)	74.7	72.3	74.2	78.2	74.9
All accidents, including automobile accidents (169–195)	68.9	67.3	73.0	70.2	69.3
Automobile accidents (170 a, b, c)	16.1	19.6	28.1	24.4	23.1

[1] Includes all States listed in table 5, except Minnesota and Washington. The District of Columbia is counted as a State.

ber of delayed certificates, the rates are preliminary and will differ from final figures subsequently published by the Bureau of the Census. Data for preceding years from the same source, collected and tabulated in the same manner as the current data, are included for comparative purposes. These provisional rates for preceding years are used in preference to the final figures published by the Bureau of the Census, because it is believed that they are more comparable with current provisional information.

These reports provide an early index of the trend of mortality from certain causes for the country as a whole. It is believed, also, that the trend of mortality from given causes within a State is reasonably accurate, even though the comparison of the causes of death for different States is subject to the errors mentioned above.

The populations of the different States used in computing these rates are estimates as of July 1 of each year which are published by the Bureau of the Census. The estimates include members of the armed forces stationed in each State; they are based partly on ration book registrations and partly on births and deaths since the 1940

TABLE 3.—*Mortality from certain causes in each quarter of 1943, 1942, and 1941, in the 39 States [1] with available data*

[Rates provisional for all years]

Period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid and paratyphoid fever (1-2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and polioencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis, all forms (13-22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107-109)	Cancer, all forms (45-55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90-95)	Nephritis, all forms (130-132)	All accidents, including automobile accidents (169-195)	Automobile accidents (170 a, b, c)
January-December																									
1943	10.9	21.3	40	2.3	0.5	1.3	7.0	0.3	0.8	2.4	0.9	2.1	0.8	0.5	41.4	11.1	12.8	52	125	27.9	96	324	75	69	16.1
1942	10.3	20.6	40	2.5	.5	1.3	6.5	.3	.8	1.8	.8	.7	.4	.4	41.7	11.3	8.0	46	123	25.7	91	298	72	67	19.6
1941	10.4	18.5	45	3.0	.8	(2)	7.5	.3	.9	2.7	1.6	.5	.5	.7	43.2	(2)	15.9	48	121	25.8	88	292	74	73	28.1
January-March																									
1943	11.5	21.1	44	2.3	.3	.5	4.2	.5	1.0	2.4	1.2	2.5	.2	.5	41.9	11.9	15.5	72	123	29.8	103	353	80	66	13.8
1942	11.2	19.0	46	2.7	.3	.8	3.3	.5	.9	1.9	1.5	.6	.2	.4	43.7	11.9	15.4	69	123	29.0	95	329	80	67	22.6
1941	11.8	17.2	53	3.1	.5	(2)	3.4	.5	.8	2.9	1.6	.6	.3	.5	46.9	(2)	45.4	82	120	30.9	97	341	85	67	23.3
April-June																									
1943	10.8	20.6	40	2.4	.4	1.1	6.2	.4	.5	2.8	1.8	2.6	.3	.5	45.1	11.1	8.4	48	124	27.8	95	321	77	68	13.2
1942	10.0	18.7	41	2.5	.5	1.1	5.6	.3	.3	1.8	1.3	.7	.1	.4	44.5	11.2	6.4	40	121	25.1	87	287	71	65	18.0
1941	10.3	17.7	45	3.3	.6	(2)	5.5	.4	.4	3.1	3.7	.5	.2	.5	46.7	(2)	9.1	41	120	25.9	8[illegible]	290	75	70	24.5
July-September																									
1943	9.7	22.3	37	2.4	.9	2.3	10.9	.2	.5	2.6	.4	1.3	1.9	.5	39.4	9.9	2.8	26	124	23.6	84	267	64	69	15.8
1942	9.4	21.4	38	2.6	.7	2.1	10.1	.2	.5	1.7	.2	.5	.7	.4	38.7	10.3	2.4	27	122	22.1	80	257	64	68	18.7
1941	9.5	20.0	40	3.1	1.3	(2)	12.9	.2	.7	2.7	.7	.4	1.0	1.2	40.1	(2)	2.7	26	120	22.0	78	251	65	79	30.2
October-December																									
1943	11.6	21.1	40	2.1	.5	1.2	6.6	.3	1.1	2.0	.4	2.3	.7	.4	39.3	11.5	24.4	65	129	30.6	101	355	78	73	21.3
1942	10.8	23.4	36	2.2	.5	1.3	6.9	.3	1.7	1.7	.2	.8	.5	.5	40.0	11.7	7.9	50	126	26.8	97	321	75	69	19.0
1941	10.2	19.2	43	2.[illegible]	.8	(2)	8.1	.3	1.7	1.9	.3	.5	.6	.5	39.3	(2)	7.0	43	122	24.6	88	288	72	77	34.2
Industrial policy holders [3]																									
1943	7.8				.3		[4] 4.5	.4	–	1.2	.6				40.0	9.7	6.0	35	106	28.4	[5] 66	[6] 229	[7] 51	52	13.2
1942	7.3				.4		[4] 4.4	.4	.6	1.0	.5				41.7	10.6	4.3	29	106	28.0	[5] 60	[6] 214	[7] 49	49	16.7
1941	7.4				.5		[4] 5.0	.4		1.3	.8				42.8	11.5	7.8	31	105	27.4	[5] 61	[6] 211	[7] 52	50	20.8

[1] States included are those listed in table 5, except Minnesota and Washington. The District of Columbia is counted as a State.
[2] Data not available.
[3] These data are taken from the January 1944 Monthly Statistical Bulletin published by the Metropolitan Life Insurance Co. The figures are subject to revision since they are based on provisional estimates of lives exposed to risk.
[4] Classified as diarrhea and enteritis, age not given.
[5] Cerebral hemorrhage.
[6] International List (1940) titles 92, 93 c, d, e, 94 a, b, and 95 only.
[7] Chronic nephritis (Bright's disease) only.

Table 4.—*Trend of death rates from all causes, of birth rates, and of infant and maternal mortality rates, 1939–43*

[Rates provisional for all years]

State	Deaths, all causes (rate per 1,000 population)					Births, exclusive of stillbirths (rate per 1,000 population)					Infant mortality (rate per 1,000 live births)					Maternal mortality (rate per 1,000 live births)				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	11.1	11.2	10.7	11.1	11.2	21.4	21.6	19.0	18.9	18.3	50	47	51	60	53	1.9	1.7	3.3	4.4	5.1
Connecticut	9.5	9.1	9.2	9.5	10.0	17.3	16.9	13.6	11.8	12.5	29	30	32	38	38	1.6	2.1	2.4	3.5	2.9
Delaware	11.8	11.6	11.8	12.2	11.8	21.0	19.2	18.1	16.5	16.3	46	47	43	51	44	2.4	1.7	2.2	5.0	4.7
District of Columbia	10.8	10.4	11.5	12.6	12.7	26.2	24.6	24.0	22.2	21.5	41	44	50	47	47	1.9	2.2	2.6	2.8	4.7
Florida	10.2	10.4	11.5	11.9	11.4	19.4	18.7	19.0	17.3	17.0	45	47	54	54	57	3.7	4.2	6.4	6.3	6.4
Georgia	9.1	8.9	9.6	10.0	9.7	24.2	22.4	20.6	20.1	19.9	46	49	59	58	59	3.9	4.1	4.4	5.2	5.5
Idaho	8.7	9.5	8.7	9.3	9.2	25.4	24.1	23.3	22.4	21.9	27	35	34	41	45	2.6	2.7	2.3	3.2	2.5
Illinois	11.8	11.0	10.6	11.2	11.0	19.8	19.3	16.9	15.6	15.0	33	33	34	35	38	1.9	1.9	2.5	2.9	3.0
Indiana	11.6	11.4	10.9	11.3	11.1	20.6	21.3	17.5	16.5	15.6	41	37	39	39	41	2.3	2.7	2.8	2.7	3.9
Iowa	11.4	10.2	9.6	9.8	9.9	20.8	19.7	16.7	17.9	17.0	34	34	38	34	39	1.7	2.7	2.6	3.1	2.6
Kansas	10.8	10.5	10.4	10.2	10.3	20.1	19.0	17.4	16.0	16.0	33	35	37	38	39	2.1	2.4	2.4	3.6	3.4
Kentucky	9.9	9.7	10.4	10.3	10.4	22.9	22.5	21.6	21.7	20.8	50	49	58	46	54	2.0	2.8	4.0	3.8	4.4
Louisiana	9.4	9.2	9.7	10.9	10.4	23.2	22.4	21.9	21.0	20.5	46	49	58	65	61	2.9	3.1	4.1	5.3	6.0
Maine	13.4	12.5	12.6	12.4	12.8	23.0	20.9	18.5	17.5	17.6	50	43	51	54	51	2.1	2.0	2.6	4.2	4.2
Maryland	11.5	11.1	11.6	12.1	11.5	21.0	20.2	18.3	16.7	15.7	45	46	55	49	50	1.6	1.9	2.2	2.7	3.3
Massachusetts	12.9	11.5	11.4	11.8	11.6	(1)	19.0	15.9	15.2	14.5	(1)	32	35	38	37	(1)	2.1	2.9	2.8	3.5
Michigan	10.5	9.5	9.7	9.9	10.1	23.2	22.1	19.8	18.8	18.3	38	37	39	41	42	1.8	2.1	2.7	2.9	2.9
Minnesota	10.6	9.8	9.5	9.5	9.5	22.5	21.9	19.5	18.5	17.6	31	30	34	33	36	1.5	1.5	1.9	2.3	2.5
Missouri	11.8	11.1	11.5	11.5	11.5	22.1	19.8	20.4	17.1	17.2	36	38	40	43	43	2.0	2.5	2.6	3.5	3.4
Montana	11.5	10.5	10.3	10.2	10.6	23.2	22.6	21.2	20.4	19.4	40	35	37	46	50	1.7	2.1	1.7	3.5	3.2
Nebraska	10.5	9.8	9.5	9.5	9.1	20.1	18.9	17.1	16.5	16.5	35	33	34	36	34	1.7	1.7	2.3	3.2	3.4
Nevada	11.5	12.5	11.9	12.0	11.3	21.6	19.1	17.5	18.7	17.3	49	59	41	50	44	2.3	.8	2.9	4.9	4.2
New Jersey	11.7	10.8	10.7	10.8	10.5	19.0	18.9	15.5	14.1	13.6	34	31	36	36	38	1.8	1.9	2.7	2.8	2.9
New Mexico	10.7	9.7	10.5	10.5	10.9	30.0	26.7	27.1	29.8	30.0	89	91	97	93	96	4.5	4.1	3.9	4.4	4.3
New York	12.6	11.5	11.1	11.1	11.1	19.4	18.9	15.9	14.7	14.1	33	32	33	37	39	2.1	2.2	2.3	2.9	3.0
North Carolina	8.3	8.3	8.9	9.0	9.0	26.3	25.2	23.6	23.0	22.7	46	48	59	56	58	3.3	3.4	4.1	5.3	4.8
North Dakota	9.0	7.8	8.3	7.9	8.4	25.6	22.2	21.5	20.9	20.8	30	37	39	41	48	2.7	2.5	2.2	1.6	2.8
Ohio	11.8	11.1	11.2	11.3	11.2	20.4	20.3	17.6	16.3	15.6	40	38	41	39	42	2.1	2.0	2.5	3.3	3.6
Oklahoma	9.0	9.3	8.8	8.8	8.9	20.9	21.3	19.6	19.0	18.8	46	40	49	50	52	2.4	3.5	3.0	3.5	4.2
Pennsylvania	12.0	11.1	10.8	10.9	10.7	21.0	20.9	18.0	16.3	16.3	34	36	39	44	44	1.8	1.9	2.2	2.5	3.2
Rhode Island	11.9	11.0	10.9	11.2	11.0	19.5	19.0	15.9	15.0	14.7	43	40	36	38	40	2.1	1.9	2.1	2.4	3.2
South Carolina	7.5	8.0	10.3	10.6	10.0	24.0	22.5	23.2	22.6	21.7	50	56	77	70	68	4.1	5.0	5.9	6.3	5.9
South Dakota	9.6	9.3	9.1	8.7	8.9	23.3	21.0	19.5	18.9	18.0	34	38	41	39	41	1.3	2.3	2.2	3.7	3.0
Tennessee	9.3	9.1	9.7	10.0	9.7	23.4	21.4	19.5	18.2	17.6	45	48	56	55	54	3.0	3.3	3.8	4.8	5.5
Texas	8.6	8.5	9.0	9.3	8.7	(1)	21.6	20.8	19.8	19.1	(1)	52	57	68	67	(1)	3.0	3.6	4.5	4.9
Utah	7.6	8.5	8.2	8.9	8.5	28.1	27.8	24.4	24.3	23.1	30	33	30	40	37	1.5	1.8	1.7	2.4	2.8
Vermont	13.4	11.4	11.5	11.6	11.7	20.3	19.3	18.1	18.4	15.9	41	44	44	46	46	2.3	1.8	2.2	3.5	3.3
Virginia	9.2	9.5	10.8	11.0	10.7	21.6	20.9	20.3	20.0	19.4	49	55	68	60	62	2.8	3.2	4.0	4.4	4.9
Washington	11.1	10.7	10.6	11.4	10.8	21.8	20.5	17.2	16.1	15.3	35	32	35	35	38	1.8	2.0	2.1	3.2	3.8
Wisconsin	10.6	9.8	9.7	10.0	9.9	21.2	20.2	17.5	17.3	17.2	35	32	36	37	40	2.2	2.0	2.5	2.6	2.8
Wyoming	8.7	8.5	8.8	8.6	8.9	22.4	21.6	20.4	20.1	19.7	37	46	45	47	45	1.2	2.4	2.3	4.4	3.5
Alaska	18.6	18.1	18.2	17.4	16.5	21.4	19.4	26.6	23.7	21.2	122	109	96	132	121	1.8	3.2	5.0	2.3	3.3
Hawaii	7.6	7.6	7.4	7.3	7.5	26.7	23.8	23.5	22.6	21.7	38	39	40	44	54	1.4	2.8	2.5	2.2	5.5
Canal Zone	10.5	------	------	------	------	21.0	------	------	------	------	38	------	------	------	------	3.7	------	------	------	------

TABLE 5.—*Trend of death rates for various causes per 100,000 population, 1939–43*

[Rates provisional for all years]

State	Typhoid and paratyphoid fever (1 2)					Dysentery (27)					Diarrhea and enteritis under 2 years (119)					Appendicitis (121)				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	0.2	0.7	0.8	0.6	1.9	1.1	1.4	1.2	1.2	1.8	12.2	13.1	11.5	14.8	12.1	8.3	9.1	12.8	14.2	15.3
Connecticut	.1	.1	.3	.3	.4	.2	.1	.2	.1	1.1	2.9	2.5	2.3	1.9	2.1	4.9	5.0	7.3	8.8	9.2
Delaware	.4	.4	(1)	.7	2.6	.4	.4	.7	.8	.4	14.2	14.7	10.3	4.9	5.3	3.9	3.9	8.0	10.1	12.2
District of Columbia	.2	.3	.7	.7	.8	.4	.3	1.1	1.5	.5	12.8	19.9	21.5	14.3	11.5	6.4	6.9	7.9	11.8	12.5
Florida	.8	1.3	.8	1.3	1.5	1.6	1.8	1.9	1.6	2.4	7.0	7.3	6.4	7.6	10.5	3.2	5.8	7.9	10.3	10.8
Georgia	.7	.7	1.7	2.0	2.6	2.4	2.7	3.3	3.9	4.3	9.1	8.8	13.8	12.5	13.0	5.9	5.4	7.1	9.0	9.4
Idaho	.6	1.0	1.0	1.1	3.1	.6	(1)	.6	1.5	.6	.2	.6	1.6	6.5	5.8	5.4	6.9	11.8	16.0	16.7
Illinois	.2	.2	.4	.4	1.4	.4	.7	.5	.7	.9	3.4	2.0	3.3	2.5	3.1	6.6	6.7	9.2	10.7	11.6
Indiana	.4	.3	.6	.8	1.1	.4	.6	1.0	.8	.9	7.9	7.2	6.2	3.5	5.5	6.7	7.8	7.8	10.7	10.8
Iowa	.1	(1)	.2	.4	.6	.2	.2	.4	.4	1.0	2.3	2.3	1.8	2.1	2.3	6.6	7.2	8.9	10.1	12.8
Kansas	.2	.4	.3	.6	.7	.3	.5	.3	.6	1.3	2.5	3.8	2.8	3.8	4.0	7.0	8.1	10.6	11.7	14.0
Kentucky	1.6	1.5	2.8	2.5	4.3	5.6	4.8	9.0	4.1	6.8	13.8	12.8	20.7	13.7	19.0	6.3	6.3	9.2	10.7	10.8
Louisiana	1.5	1.7	2.5	3.7	5.8	1.4	1.8	2.3	3.0	2.8	6.4	7.7	9.4	14.9	12.4	6.3	6.0	6.0	9.7	12.5
Maine	.5	.5	.4	.6	1.1	(1)	.2	.2	.1	.1	9.[illegible]	7.[illegible]	6.2	5.3	5.6	5.0	8.0	9.9	12.7	11.6
Maryland	.3	.5	.9	.6	.9	1.1	1.2	2.1	1.0	2.1	11.8	12.4	16.1	6.7	9.4	3.7	4.3	5.9	6.4	8.0
Massachusetts	.2	.0	.1	.2	.3	.1	.1	.2	.1	.3	4.6	2.7	3.9	3.0	2.0	5.9	5.2	7.2	9.8	9.9
Michigan	.2	.1	.2	.2	.6	.4	.6	.8	.3	.5	4.8	4.3	4.7	3.3	5.2	6.0	5.7	8.2	9.8	11.1
Minnesota	(1)	.2	.1	.2	.1	(2)	.3	.0	.3	.5	1.9	2.5	2.6	2.5	3.3	(2)	5.9	7.6	10.6	11.2
Missouri	.9	.8	1.1	1.9	2.6	1.3	1.1	1.9	2.0	2.6	6.5	5.2	6.8	8.2	9.0	7.0	6.6	10.0	11.9	12.2
Montana	.6	(1)	.4	.7	2.2	2.1	.6	1.1	1.6	1.3	4.3	3.7	4.9	7.0	5.2	7.8	7.4	11.5	14.7	15.8
Nebraska	.1	.2	.4	.4	.4	.2	.2	.2	.5	.5	1.7	2.3	1.3	2.4	2.2	5.4	6.2	8.5	12.6	12.3
Nevada	.7	1.5	2.5	.9	.9	1.4	5.9	1.6	.9	(1)	6.3	12.5	4.2	3.6	3.7	13.3	11.8	14.8	13.6	7.4
New Jersey	.2	.1	.2	.3	.4	.2	.4	.3	.2	.2	4.2	3.0	3.2	2.3	2.8	5.9	6.3	7.9	10.3	11.2
New Mexico	1.7	1.1	1.9	3.0	3.2	15.2	9.8	20.4	14.1	11.3	49.6	35.[illegible]	47.4	41.7	38.0	6.2	6.6	11.2	12.2	11.5
New York	.2	.2	.2	.3	.3	.2	.3	.5	.2	.3	3.6	3.2	2.8	3.0	4.3	6.3	6.2	8.2	9.6	10.6
North Carolina	.5	.6	.9	1.1	1.3	1.5	1.6	2.5	1.7	2.3	12.0	13.0	20.3	13.1	19.0	5.0	5.4	6.4	6.3	7.8
North Dakota	.6	.2	.2	.6	.6	.4	.5	.2	.8	.3	3.3	6.2	3.5	5.8	7.0	5.2	7.5	7.3	11.1	13.1
Ohio	.6	.3	.5	.7	[illegible]	.3	.3	.5	.2	.6	7.3	6.6	7.7	4.4	5.1	5.6	5.9	8.5	9.9	11.4
Oklahoma	1.1	1.6	1.5	2.5	3.9	2.6	3.[illegible]	2.7	3.4	4.1	6.5	5.6	7.5	10.4	9.4	7.2	8.3	11.9	12.0	14.7
Pennsylvania	.3	.4	.5	.6	.6	.4	.2	.4	.2	.3	4.3	3.7	4.6	3.8	4.5	5.2	5.9	7.2	8.9	9.8
Rhode Island	(1)	.1	.1	1.0	.1	.1	( )	.1	.1	(1)	7.9	9.4	3.0	2.0	4.0	4.4	4.3	5.9	11.8	12.7
South Carolina	1.3	1.9	2.7	4.1	5.1	2.4	1.5	4.6	3.5	2.8	6.7	6.8	9.5	6.5	7.0	3.4	4.2	5.8	6.7	7.0
South Dakota	.2	.9	.3	(1)	1.[illegible]	.3	.2	.5	.2	.8	2.4	3.2	2.7	5.1	5.4	7.6	7.7	10.4	10.6	11.5
Tennessee	1.0	.7	1.5	2.1	3.3	3.0	2.4	3.7	5.7	4.[illegible]	9.4	9.3	12.7	10.6	12.8	6.2	6.5	6.9	8.6	9.8
Texas	1.1	1.2	2.1	3.1	4.5	5.6	5.4	6.2	10.1	6.5	19.7	17.1	15.8	29.1	25.7	5.9	6.6	8.2	9.8	11.8
Utah	.3	.5	.7	.5	.4	.5		.4	.5	.9	2.7	3.1	2.5	3.6	2.2	6.6	8.8	9.7	12.4	16.6
Vermont	(1)	.3	.8	.8	.3	.3	.6	.3	.8	1.4	3.1	3.5	4.5	4.7	3.6	9.2	7.6	9.6	13.9	15.1
Virginia	.6	.9	1.1	1.0	1.8	2	3.1	5.0	2.9	3.9	8.0	10.5	16.6	8.7	11.1	4.3	5.0	5.5	7.3	7.5
Washington	.2	.2	.2	.7	1.0	.8	.3	.8	1.8	1.2	3.0	2.4	1.9	2.2	2.2	4.8	4.8	7.5	9.8	10.7
Wisconsin	.2	.0	.2	.1	.2	.3	.2	.3	.3	.4	2.9	2.2	2.4	3.2	4.6	6.4	6.3	7.7	11.1	10.5
Wyoming	.4	(1)	1.2	.8	2.8	.4	.4	(1)	1.6	.8	2.1	3.2	2.8	6.0	6.0	8.3	10.4	9.5	14.8	19.4
Alaska	1.3	(1)	2.7	(1)	(1)	(1)	(1)				1.3	6.6	5.3	4.1	(1)	5.2	5.3			
Hawaii	.2	1.6	1.2	2.4	1.9	.7	.5	.5	.2	.2	5.7	6.4	8.1	5.7	11.1	3.2	4.6	4.5	8.0	7.0
Canal Zone	(1)					(1)					3.9					7.7				

[1] No deaths reported

[2] Data not available

TABLE 5.—*Trend of death rates for various causes per 100,000 population, 1939-43*—Continued

State	Scarlet fever (8)					Diphtheria (10)					Whooping cough (9)					Measles (35)				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	0.7	1.0	0.6	0.5	1.0	1.8	2.1	2.1	1.2	2.9	1.8	2.4	5.4	2.9	4.6	3.0	1.4	1.3	1.3	1.8
Connecticut	.1	[1]	.1	[1]	.2	[1]	[1]	[1]	.2	.4	.3	.8	.5	.2	1.3	.3	.2	.1	.2	.5
Delaware	[1]	1.4	.7	1.1	.4	[1]	[1]	.4	[1]	.8	4.6	4.3	2.2	2.2	3.0	.4	[1]	2.2	[1]	[1]
District of Columbia	.9	.2	[1]	.3	.2	.1	.3	.3	.4	.8	4.6	2.0	1.3	1.6	2.3	.7	[1]	.5	[1]	.3
Florida	.2	.1	.1	.1	.3	1.1	1.4	1.1	1.4	1.9	2.7	2.2	1.9	1.7	3.1	.3	2.5	.9	.3	.7
Georgia	.2	.1	.3	.5	.5	1.5	1.7	1.6	1.8	2.9	5.3	3.1	4.3	3.3	4.0	.9	1.9	4.7	.7	1.6
Idaho	.6	.2	.4	1.3	.4	1.0	.8	.2	.2	.8	1.2	.8	3.7	1.3	1.9	2.6	.6	.2	.9	.8
Illinois	.3	.4	.5	.8	.9	1.0	.8	.7	1.1	1.5	1.3	1.2	1.1	.8	2.0	.7	.4	1.1	.2	.0
Indiana	.5	.4	.7	1.2	1.4	.7	.5	.7	1.0	1.6	3.2	1.9	1.4	2.2	1.8	2.1	.3	1.6	.1	.2
Iowa	.7	.3	.3	.7	.9	.5	.4	.3	.5	.6	1.7	1.3	1.5	.9	1.7	.8	.6	.6	.5	1.1
Kansas	.9	.3	.3	.5	.7	.8	.3	.5	.7	.4	1.9	1.0	3.3	1.8	.4	.4	1.2	1.9	.9	.2
Kentucky	.4	.8	.9	1.0	1.1	1.4	2.0	1.9	1.8	3.2	4.3	4.1	8.1	6.1	2.4	3.6	.9	5.6	.6	1.1
Louisiana	[1]	.1	.2	0	.2	1.0	1.8	1.6	2.1	2.9	4.6	2.6	1.7	6.4	4.8	.5	1.1	.1	.5	4.1
Maine	.5	.7	.1	.7	.4	.7	.4	.4	.7	2.1	2.9	3.0	2.3	2.5	3.6	.5	1.4	1.3	1.1	.6
Maryland	.2	.2	.2	.4	.3	.4	.3	.4	.4	1.1	2.7	1.2	4.1	3.5	1.1	.3	.7	.7	.1	.9
Massachusetts	.5	.2	.3	.3	.3	.2	.2	[illegible]	.2	.3	.9	.6	1.0	.5	1.0	.5	.4	.1	.3	.4
Michigan	.2	.4	.6	.8	1.3	.4	.4	.4	.4	.5	1.9	1.2	1.6	1.2	1.5	1.6	.1	1.2	.3	.6
Minnesota	.4	.3	.3	.5	.6	1.3	.7	.1	.2	.4	1.1	.3	1.1	1.1	.6	2.3	.5	.1	.2	2.3
Missouri	.6	.3	.6	.6	.8	1.1	1.1	1.1	1.7	2.0	2.5	1.0	4.7	2.1	1.8	1.5	1.2	2.9	.5	.8
Montana	.6	.6	1.5	1.6	1.6	1.0	1.0	2.6	1.1	1.6	3.5	2.3	1.1	.9	2.9	1.7	[1]	.2	.9	2.9
Nebraska	.7	.3	.3	.9	1.0	.8	.6	.3	.8	1.0	2.0	1.0	2.4	.8	1.0	1.1	.6	.3	.5	1.0
Nevada	[1]	1.5	[1]	[1]	[1]	[1]	[1]	[1]	.1	[1]	2.1	5.9	3.4	.3	[1]	[1]	1.5	[1]	[1]	1.8
New Jersey	.3	.2	.2	.4	.5	.3	.1	.2	.6	.6	.9	1.1	.9	.6	1.1	.5	.2	.6	.2	.1
New Mexico	.4	.2	.4	.6	.4	1.9	2.6	1.7	1.3	2.9	6.9	6.8	9.9	9.5	7.1	2.8	5.0	9.3	.9	.8
New York	.3	.2	.2	.3	.4	.2	.1	.1	.1	.2	1.1	1.1	.7	1.0	1.0	.7	.1	.4	.1	.4
North Carolina	.1	.3	.3	.3	.4	1.5	2.0	2.5	2.3	4.9	2.9	2.8	5.5	2.5	6.4	.5	1.5	2.7	.3	1.8
North Dakota	[1]	.5	.3	.8	1.1	1.5	.7	1.0	1.4	2.0	.9	2.1	2.4	2.2	2.0	2.4	3.4	.3	.3	3.4
Ohio	.5	.5	.4	.6	1.1	.6	.4	.4	.4	.9	1.9	1.8	2.6	1.8	1.2	.8	1.6	.0	.0	.1
Oklahoma	.2	.1	.2	.3	.7	1.1	2.3	3.0	3.2	3.3	3.9	2.2	5.1	2.4	1.0	.2	4.5	1.0	.2	3.2
Pennsylvania	.3	.4	.3	.5	.6	.3	.2	.2	.4	.7	2.0	1.5	1.5	1.3	1.5	.6	.4	1.0	.1	.1
Rhode Island	.5	.4	.3	[1]	[1]	.4	.8	.1	.3	.1	1.9	1.2	.6	.3	2.0	.1	.5	.1	.4	.4
South Carolina	.1	[1]	.3	.1	.2	1.6	2.7	3.7	2.9	4.3	3.3	3.5	10.4	2.6	6.5	.5	1.6	7.0	.7	.5
South Dakota	.7	.2	.2	.6	1.2	1.0	3.6	2.0	.8	3.2	2.3	4.9	4.4	.6	.9	4.7	[1]	1.0	.5	4.3
Tennessee	.4	.4	.5	.5	.6	1.3	1.4	1.7	1.6	3.0	6.1	2.3	5.4	3.9	3.3	1.3	1.2	4.3	.6	1.5
Texas	.1	.2	.1	.2	.3	2.0	2.3	2.5	2.3	2.6	3.8	2.5	3.4	3.7	3.3	.5	1.5	1.2	3.1	1.3
Utah	[1]	.7	[1]	1.1	.4	[1]	.5	.2	[1]	.9	.9	.7	1.6	1.8	1.1	2.1	2.3	[1]	.9	.4
Vermont	[1]	.3	.6	.3	1.1	[1]	.3	[1]	[1]	.8	3.1	3.8	[1]	1.7	6.7	4.3	.9	.6	[1]	1.7
Virginia	.3	.4	.3	.4	.3	.8	1.4	1.5	2.0	3.7	4.0	3.3	8.7	4.6	5.8	.4	.5	5.9	.8	.8
Washington	.4	.4	.1	.4	.7	1.2	1.0	.4	.6	.7	1.1	1.4	2.3	1.1	.2	2.3	.6	.2	1.0	.9
Wisconsin	.6	.8	.6	.7	1.1	.2	.2	.0	.2	.1	1.6	1.2	1.0	1.1	1.4	1.2	.3	.7	.3	.6
Wyoming	.8	1.6	.8	.4	.4	.8	.4	2.4	1.6	1.2	.8	2.4	1.6	.4	.4	2.0	1.2	.8	2.4	.4
Alaska	1.3	[1]	[1]	[1]	8.3	5.2	3.9	1.3	4.1	1.4	5.9	11.8	5.3	21.8	26.3	20.7	56.5	46.8	159.2	54.0
Hawaii	[1]	.2	[1]	[1]	[1]	.2	.2	.5	1.4	1.0	3.2	3.0	1.6	1.9	7.2	[1]	.2	1.2	[1]	[1]
Canal Zone	[1]	------	------	------	------	[1]	------	------	------	------	[1]	------	------	------	------	[1]	------	------	------	------

[1] No deaths reported.

State	Cerebrospinal (meningococcus) meningitis (6)					Acute poliomyelitis and polio-encephalitis (36)					Acute infectious encephalitis (lethargic) (37)					Malaria (38)				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	2.7	1.5	0.5	0.4	0.7	2.6	0.5	0.5	1.2	1.1	0.3	0.6	2.1	0.7	0.5	0.1	0.1	0.1	------	------
Connecticut	1.4	.7	.1	.4	.2	.9	.1	.1	.1	.1	.4	.2	.1	.2	.1	------	------	------	------	------
Delaware	7.8	(1)	(1)	.7	1.5	(1)	(1)	.7	.7	.4	1.4	1.4	.7	(1)	1.1	------	------	------	------	------
District of Columbia	3.8	1.5	.5	.7	.6	.2	.1	1.2	.4	.2	(1)	.0	.1	.7	.2	------	------	.1	0.1	0.2
Florida	1.9	.6	.1	.4	.5	.2	.2	1.1	.4	.3	.3	.2	.2	.3	.4	1.7	2.3	4.3	5.2	6.1
Georgia	1.3	.7	.5	.3	.5	.1	.3	1.0	.2	.5	.2	.2	.2	.1	.1	1.1	2.4	2.3	2.8	3.1
Idaho	4.6	.4	.6	.9	1.7	2.4	(1)	.2	.6	1.5	.4	.4	1.0	.9	1.5	.2	------	------	.2	.2
Illinois	2.0	.3	.2	.2	.2	2.0	.4	.3	.7	.3	.4	.3	.3	.8	.2	.1	.2	.1	.2	.4
Indiana	1.8	.1	.5	.3	.4	.6	.7	.4	2.1	.1	.4	.4	.1	.6	.5	.2	.3	------	.3	.2
Iowa	.9	.1	.5	.6	.4	.6	.1	.2	2.2	1.1	.3	.2	.7	.8	.7	.0	------	------	------	------
Kansas	1.3	.2	.5	.6	.4	3.6	1.1	.5	2.2	.3	1.2	1.0	1.6	.8	1.6	.2	------	.2	.3	.1
Kentucky	2.8	1.0	1.1	1.2	1.2	.5	.9	1.2	1.4	1.2	.6	.4	.1	.5	.8	.5	.4	.6	.6	1.1
Louisiana	1.0	.7	.7	.6	.6	.4	.4	.3	.8	.4	.2	.2	.1	.2	.3	1.1	1.7	2.9	3.7	5.0
Maine	6.1	3.0	1.2	1.1	.4	.4	.4	.6	.2	.7	.5	.7	.4	.4	.6	------	.1	------	.1	------
Maryland	4.3	2.3	1.1	.3	.6	.0	(1)	.3	.3	.1	.5	.4	.7	.4	.4	------	.1	------	------	------
Massachusetts	2.9	.8	.6	.3	.4	.4	.1	.2	.1	.1	.2	.3	.3	.2	.2	.0	.1	.0	------	.0
Michigan	2.3	.4	.2	.2	.3	.5	.2	.3	1.3	.8	.3	.3	.3	.3	.1	.1	.1	.1	.0	.0
Minnesota	2.4	.3	.3	.2	.1	1.4	.3	1.4	.9	1.9	1.6	.6	2.5	.5	.3	------	------	------	------	------
Missouri	2.6	.5	.4	.3	.5	1.0	.4	.4	1.0	.5	.7	.6	.7	.3	.4	.7	.4	.6	1.2	1.8
Montana	1.2	1.4	.7	1.2	.9	1.0	(1)	1.8	1.4	(1)	.8	1.6	2.6	1.8	1.4	------	------	------	------	------
Nebraska	1.3	.2	.5	.3	.2	1.7	2.2	.9	1.6	.6	3	.2	1.3	.5	.4	.1	------	------	------	------
Nevada	2.8	2.2	(1)	.9	.9	2.1	.7	(1)	.9	(1)	(1)	1.5	.9	(1)	(1)	------	------	------	------	------
New Jersey	3.0	.7	.3	.1	.5	.2	.6	.4	.1	.7	.6	.6	.4	.6	.5	.0	.1	------	------	.0
New Mexico	1.7	.6	.2	.6	1.0	1.7	1.3	.4	.6	1.5	.2	.9	.4	(1)	.4	.2	------	1.5	.7	.8
New York	2.8	.9	.5	.4	.5	.3	.2	.4	.1	.4	1.1	.9	.8	.9	.4	.0	.0	.0	.1	.2
North Carolina	1.3	.5	.4	.3	.5	.4	.3	.4	.3	.3	.1	.1	.3	.3	.2	.7	1.1	.9	1.8	1.7
North Dakota	1.7	.2	.2	.3	.5	.4	.3	.2	.6	.3	2.0	1.9	21.4	2.0	1.7	.2	------	------	------	------
Ohio	1.4	.2	.2	.4	.2	.2	.3	.7	.8	.2	.5	.2	.7	.5	.6	.1	.1	.1	.1	.1
Oklahoma	1.7	.5	.3	.9	.5	1.5	.7	.6	1.2	.4	.4	.5	.4	.6	.6	1.4	1.0	2.3	1.0	2.2
Pennsylvania	2.1	.7	.3	.6	.6	.2	.2	.6	.3	.5	.0	.2	.7	.6	.6	.0	.0	------	------	------
Rhode Island	6.5	.9	.3	.3	.6	1.1	.1	.4	.3	(1)	.8	.7	.6	.3	(1)	.1	------	------	------	------
South Carolina	1.6	.7	1.3	.4	.4	.3	.3	.6	.5	2.2	.1	.1	.1	.3	.2	2.6	4.5	6.3	6.8	9.0
South Dakota	1.7	1.5	.3	.6	.8	.2	.2	.3	.8	.6	1.2	.3	.8	.2	.5	------	------	------	------	------
Tennessee	1.9	.6	1.2	.6	.7	.2	.9	1.5	.3	.5	.3	.6	.5	.6	.7	.8	1.2	1.8	2.2	3.4
Texas	.8	.5	.4	.5	.3	2.3	.7	.8	.6	1.1	.2	.2	.3	.4	.3	.8	1.3	2.1	2.4	2.2
Utah	3.5	.2	.4	.5	.9	3.9	(1)	.2	1.1	1.3	.8	.5	.9	.4	.9	.2	------	------	------	------
Vermont	1.8	.3	.8	1.4	.6	.6	1.2	.3	.3	1.4	(1)	.3	(1)	.3	.3	------	------	------	------	------
Virginia	3.3	1.8	1.4	1.2	.9	.2	.2	.4	1.0	.3	.5	.5	.1	.7	.3	.0	.2	.1	.2	.3
Washington	2.4	.5	.3	.5	.5	1.4	.6	.9	2.0	.4	1.6	1.0	1.2	2.2	1.5	------	------	------	------	------
Wisconsin	1.3	.4	.1	.2	.2	.6	.3	.6	1.4	.4	.8	.5	.6	.8	.3	.0	------	.0	.1	------
Wyoming	.8	.8	1.6	2.8	.8	2.4	.8	(1)	2.8	1.2	1.6	(1)	2.8	1.6	(1)	.4	------	.4	------	------
Alaska	1.3	2.6	4.0	1.4	(1)	(1)	(1)	2.7	(1)	(1)	(1)	(1)	(1)	(1)	1.4	------	------	1.3	------	------
Hawaii	.7	.9	(1)	.5	.5	(1)	(1)	1.4	1.2	1.4	.5	(1)	.5	(1)	.2	.2	------	------	------	------
Canal Zone	1.9	------	------	------	------	(1)	------	------	------	------	(1)	------	------	------	------	5.8	------	------	------	------

[1] No d h reported.

TABLE 5.—*Trend of death rates for various causes per 100,000 population, 1939–43*—Continued

State	Pellagra (69)					Tuberculosis, all forms (13–22)					Syphilis (30)					Influenza (grippe) (33)				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	0.1	0.2	0.1	0.1	0.1	50.2	51.3	47.7	52.9	55.5	9.0	12.6	12.9	11.5	14.6	16.3	9.6	18.3	13.7	22.8
Connecticut	1	2	2	2	1	30.0	32.1	31.4	32.4	34.3	6.3	8.4	9.0	9.1	10.9	5.6	2.3	4.8	4.4	4.7
Delaware			4			36.6	48.7	54.1	46.8	57.1	13.2	14.7	19.7	22.1	17.1	13.2	9.0	11.8	10.5	12.9
District of Columbia	2	2	5	1	2	52.5	56.6	59.0	62.3	66.1	15.6	21.7	24.5	27.4	27.4	5.6	2.8	4.4	6.7	9.2
Florida	1.5	2.3	3.3	3.8	4.0	34.7	40.0	45.1	50.1	49.4	14.2	16.9	25.1	26.5	28.1	20.6	13.2	26.3	28.8	27.7
Georgia	6.1	5.6	6.1	7.3	8.5	40.7	39.3	41.0	47.2	46.4	13.4	14.4	16.2	20.8	20.2	19.3	15.0	31.3	28.7	29.1
Idaho	2			6	4	16.9	14.8	16.4	17.8	18.7	5.0	6.9	5.8	8.0	9.5	17.1	9.0	12.5	17.8	17.5
Illinois	1	1	2	2	3	42.0	40.6	43.6	46.2	45.8	11.0	10.4	12.6	13.6	12.8	8.1	4.7	6.4	8.1	12.3
Indiana	1	1		1	1	34.1	36.6	36.3	37.6	41.4	9.2	10.0	13.7	14.6	14.0	27.6	16.0	19.8	21.9	26.0
Iowa		1	1	1	1	16.4	16.4	13.9	15.9	17.4	7.0	8.0	8.9	6.9	8.0	17.2	9.1	13.6	16.0	23.7
Kansas	3	6	5	4	3	20.6	25.1	22.9	24.9	23.5	10.1	11.3	11.4	10.9	12.8	16.1	13.1	23.5	18.5	18.9
Kentucky	1.3	1.6	1.4	1.9	2.8	60.4	62.9	67.5	66.4	70.3	9.4	9.6	10.8	11.2	11.9	20.6	14.7	36.2	28.2	33.8
Louisiana	1.6	2.2	2.5	2.7	3.5	50.8	48.2	53.5	58.8	58.8	17.7	21.0	22.8	29.0	27.3	15.6	12.1	25.3	32.7	23.1
Maine		6	2		5	33.3	31.2	29.3	29.5	35.1	7.5	8.0	9.9	12.5	8.7	19.2	10.6	18.3	12.6	20.2
Maryland	0	1		2	4	63.9	68.3	71.9	78.6	72.1	14.2	17.4	19.1	20.6	26.9	9.9	5.3	9.5	8.4	9.7
Massachusetts	1	1	2	1	2	42.8	37.9	38.2	37.4	37.1	7.1	6.2	7.3	8.5	9.4	4.7	2.3	6.6	3.4	5.4
Michigan	1	1	1	2	0	33.3	33.0	31.9	33.3	36.5	10.7	10.1	10.3	11.5	13.1	9.8	4.0	8.1	5.1	14.5
Minnesota	1	0	0	1		29.0	26.4	27.2	26.5	28.8	(2)	7.1	9.0	8.5	8.3	11.2	7.3	9.5	8.4	11.7
Missouri	3	4	3	3	8	43.9	43.1	46.4	45.1	47.4	13.5	13.4	15.7	18.7	16.8	14.0	9.6	30.0	20.5	20.0
Montana			2		2	40.5	37.9	36.8	40.2	42.7	9.1	10.9	11.5	12.2	13.2	12.2	6.0	16.7	13.8	23.3
Nebraska		3	1	1		16.2	14.0	15.8	17.0	16.5	7.7	7.6	7.5	7.8	6.8	17.8	11.6	23.6	19.9	17.1
Nevada				9	9	46.1	53.7	46.0	68.3	52.4	16.7	13.2	28.8	19.0	13.0	7.0	5.2	6.0	11.8	6.4
New Jersey	0	0	2	3	1	43.7	43.3	42.5	42.8	43.2	8.7	9.9	11.0	12.4	13.0	9.8	3.6	5.2	4.2	5.8
New Mexico	1.3	8	2.1	3.6	2.9	73.8	59.9	65.6	70.7	72.6	12.2	10.0	11.7	14.9	17.2	15.9	12.9	14.9	13.7	19.9
New York	1	1	1	1	2	49.9	46.1	46.6	46.3	47.9	14.5	14.4	15.3	15.7	16.3	5.6	2.2	4.1	3.1	4.1
North Carolina	2.9	3.1	3.8	4.7	5.8	39.1	44.3	48.8	49.7	51.0	7.3	8.4	10.6	12.4	12.4	12.0	8.3	24.9	12.2	17.9
North Dakota				2		22.7	20.0	19.0	20.0	21.9	3.9	3.9	5.9	4.2	5.6	10.9	4.4	11.3	9.2	17.5
Ohio	2	1	2	1	1	40.1	40.7	42.2	39.9	42.6	12.8	11.6	13.1	14.6	15.7	15.8	9.2	14.4	14.7	18.7
Oklahoma	2.2	2.7	2.2	2.2	4.2	40.7	46.3	54.9	47.6	45.7	9.7	7.4	10.7	12.2	11.8	12.6	12.3	24.3	24.4	21.9
Pennsylvania	1	1	1	1	1	39.6	39.3	38.4	39.5	40.2	11.0	11.3	13.2	13.4	14.6	14.6	6.4	11.0	10.8	12.3
Rhode Island		1	1	1	3	37.7	36.0	37.2	33.0	37.5	8.5	10.0	9.3	9.3	11.0	5.5	2.6	5.2	4.3	5.1
South Carolina	3.3	3.6	6.3	8.5	7.8	31.0	36.0	42.3	46.8	44.2	13.0	12.2	17.9	19.8	19.0	15.2	13.0	32.7	33.6	29.6
South Dakota			2	2		26.7	28.7	29.8	34.3	29.2	4.2	5.8	6.7	5.8	6.2	13.5	7.7	14.0	15.4	21.1
Tennessee	2.9	3.6	4.8	3.6	5.1	63.6	68.7	77.6	72.8	78.5	11.9	13.1	14.4	13.9	15.4	19.2	16.3	32.2	31.0	31.8
Texas	3.9	3.7	4.8	5.1	5.7	45.9	51.9	55.1	56.4	57.0	11.3	11.6	12.2	14.7	13.1	12.8	12.7	30.2	26.4	20.7
Utah				4	2	10.3	11.8	11.5	15.7	16.3	4.7	6.9	5.6	5.1	5.3	9.6	8.1	8.8	19.7	12.8
Vermont	3		3			31.2	30.4	37.6	36.5	39.0	6.7	4.7	7.9	7.8	7.3	24.7	7.9	17.4	12.8	25.9
Virginia	1.2	1.8	1.7	2.1	2.2	45.0	52.1	57.7	58.8	60.0	12.5	14.1	15.1	18.1	17.6	14.2	12.9	27.3	25.1	22.2
Washington	1		1	2	1	35.4	35.3	39.3	40.8	41.6	10.4	10.9	13.1	13.8	15.1	11.2	7.9	8.1	17.2	8.5
Wisconsin	0	1	2	1	1	25.7	24.5	24.8	26.0	27.3	6.2	5.5	6.8	7.2	7.4	12.5	6.3	10.4	11.4	17.3
Wyoming			4	4	4	17.3	15.1	14.4	16.0	22.9	14.5	10.3	16.6	15.6	14.1	13.4	9.9	22.7	10.8	11.3
Alaska			1.3			346.3	340.3	426.5	367.3	361.5	6.5	2.6				38.8	18.4	62.8	10.9	22.2
Hawaii	2					57.2	62.5	60.2	61.2	66.9	12.9	13.5	12.5	11.1	16.8	5.4	3.7	2.6	8.5	5.4
Canal Zone						48.2					27.0					(1)				

[1] No deaths reported

[2] Data not available

State	Pneumonia all forms (107-109)					Cancer all forms (45-55)					Diabetes mellitus (61)					Intracranial lesions of vascular origin				
	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939	1943	1942	1941	1940	1939
Colorado	76	76	65	78	88	123	121	109	119	113	18.1	18.2	15.7	18.2	18.2	86	95	83	86	87
Connecticut	34	25	28	38	42	132	130	132	136	139	29.1	27.7	31.4	22.8	29.2	83	79	79	99	82
Delaware	75	52	53	58	70	116	120	118	131	109	39.1	32.6	27.6	31.8	33.7	111	103	99	106	115
District of Columbia	60	69	65	78	72	134	128	141	147	156	28.1	26.9	24.5	31.4	26.8	62	67	79	91	84
Florida	47	46	47	56	56	86	90	99	94	93	18.4	18.1	20.0	19.5	20.6	95	110	107	112	99
Georgia	54	50	48	63	69	66	66	64	61	61	13.4	11.5	11.6	10.9	11.4	96	89	93	94	93
Idaho	55	53	32	41	57	96	92	91	89	89	13.3	16.1	19.5	17.8	20.0	75	92	78	62	61
Illinois	41	40	40	47	54	157	147	145	143	142	33.2	30.5	28.6	33.3	30.0	93	84	80	83	75
Indiana	63	51	49	59	69	124	130	122	122	112	15.7	14.5	14.5	14.7	16.6	146	143	137	141	132
Iowa	44	45	40	49	50	156	147	131	130	125	30.9	26.0	24.2	26.5	24.5	124	115	102	106	103
Kansas	35	33	36	56	44	129	130	123	123	124	28.5	26.3	24.5	26.2	25.7	114	117	107	102	101
Kentucky	61	60	57	62	73	85	85	84	83	81	14.8	15.3	15.9	14.3	13.0	97	90	94	104	107
Louisiana	52	50	59	77	80	83	83	82	88	77	15.2	15.5	15.0	18.1	16.3	72	67	65	68	68
Maine	67	55	55	55	74	158	150	155	151	152	29.1	29.2	31.9	31.2	27.3	141	126	126	130	127
Maryland	63	58	57	62	68	127	126	138	138	132	29.7	28.0	30.2	31.3	29.2	88	87	87	97	96
Massachusetts	75	57	60	61	71	177	174	175	171	160	39.4	34.4	35.9	36.5	35.1	116	109	104	105	103
Michigan	54	42	41	47	54	126	115	116	118	117	28.3	25.1	33.0	26.6	26.2	98	87	86	90	83
Minnesota	55	50	46	56	59	154	148	141	133	134	30.0	26.7	24.3	25.9	25.9	105	96	82	91	92
Missouri	75	72	75	74	77	139	138	133	135	134	26.3	22.8	25.8	25.6	25.0	103	99	82	98	94
Montana	52	49	47	59	66	123	125	115	111	115	19.0	13.4	14.1	11.6	17.2	93	104	98	97	90
Nebraska	43	37	36	53	52	135	136	128	125	118	31.[illegible]	23.3	26.2	26.8	25.0	100	97	103	114	91
Nevada	80	63	50	70	82	85	96	109	116	112	14.7	11.8	17.1	20.9	16.6	64	90	68	67	67
New Jersey	51	40	41	44	44	147	150	147	146	140	37.3	34.3	35.3	36.4	33.6	102	91	93	90	87
New Mexico	61	61	56	58	84	71	52	56	58	53	9.2	8.7	10.6	9.4	8.6	43	40	41	40	39
New York	55	42	44	46	55	174	174	160	158	154	43.6	41.3	40.4	40.6	39.1	84	78	73	72	67
North Carolina	46	47	55	57	61	64	62	59	58	56	12.6	12.5	12.1	13.6	13.8	86	86	80	85	80
North Dakota	39	36	36	40	55	112	100	95	96	98	26.3	21.9	19.8	25.6	21.9	85	81	74	69	78
Ohio	54	46	44	56	60	140	137	137	135	132	34.5	30.9	28.9	31.2	29.2	122	112	104	111	108
Oklahoma	45	48	50	57	61	87	94	84	83	79	16.9	16.0	15.0	14.0	14.7	92	93	80	81	86
Pennsylvania	55	43	42	51	50	136	129	126	124	123	37.4	33.9	34.1	35.4	33.8	97	90	85	84	83
Rhode Island	58	49	44	54	57	150	147	148	153	151	43.0	37.8	37.7	38.8	36.9	94	100	87	100	88
South Carolina	44	49	66	68	64	46	50	57	56	54	11.0	11.3	13.3	12.7	13.4	76	81	94	105	96
South Dakota	44	43	40	37	55	116	114	103	105	101	21.3	22.7	26.4	23.9	26.7	88	90	84	82	76
Tennessee	54	55	62	71	71	81	78	86	74	71	13.4	12.8	12.4	14.0	13.4	90	86	79	83	81
Texas	46	40	47	53	53	78	73	80	76	68	13.7	12.3	13.1	13.7	11.8	68	62	61	62	61
Utah	32	31	31	44	45	87	92	87	90	92	19.5	13.3	19.4	19.5	18.3	59	64	60	58	54
Vermont	65	55	46	70	79	153	147	143	137	140	31.2	27.5	29.7	27.6	32.6	127	128	114	119	116
Virginia	51	53	57	69	67	75	77	81	81	90	16.1	16.9	18.5	20.3	17.5	94	94	99	104	104
Washington	54	46	39	48	51	127	130	135	143	139	24.3	25.0	24.2	26.4	25.3	102	110	99	107	106
Wisconsin	44	38	37	47	48	144	139	133	133	127	34.1	27.3	28.1	28.1	27.0	106	100	93	96	86
Wyoming	46	38	43	40	50	94	79	83	85	75	10.1	14.3	12.0	14.3	16.5	57	56	65	67	58
Alaska	147	104	122	144	169	76	75	83	75	79	5.2	10.5	5.3	4.1	4.2	75	66	72	76	60
Hawaii	37	44	39	46	54	77	65	77	67	71	18.3	16.5	20.2	14.4	16.6	45	46	53	44	48
Canal Zone	21					82					15.4					37				-

TABLE 5.—*Trend of death rates for various causes per 100,000 population, 1939–43*—Continued

State	Diseases of the heart (90–95) 1943	1942	1941	1940	1939	Nephritis, all forms (130–132) 1943	1942	1941	1940	1939	All accidents, including automobile accidents (169–195) 1943	1942	1941	1940	1939	Automobile accidents (170 a, b, c) 1943	1942	1941	1940	1939
Colorado	278	271	273	250	255	73	76	78	71	73	93	91	82	91	87	17.1	25.7	30.5	32.7	28.6
Connecticut	330	304	308	299	296	51	58	62	56	76	53	56	61	55	61	11.7	14.3	21.7	18.0	20.7
Delaware	362	363	349	355	363	129	123	133	134	107	65	77	81	79	72	19.6	23.7	34.3	36.3	36.3
District of Columbia	292	269	292	338	344	94	86	100	107	105	53	62	69	70	76	9.7	14.2	22.7	21.6	22.8
Florida	228	245	274	285	244	71	74	85	90	91	118	95	106	97	93	21.4	24.0	38.0	36.9	36.5
Georgia	176	164	176	191	167	98	99	102	103	92	64	64	67	64	56	19.1	20.9	28.5	24.8	19.9
Idaho	228	268	214	243	242	49	62	70	57	53	100	97	96	101	97	23.3	23.0	37.1	36.4	33.7
Illinois	406	364	339	350	339	89	81	85	92	92	63	64	76	74	71	16.1	20.2	32.1	29.6	28.4
Indiana	270	266	269	304	250	87	82	67	74	65	72	81	90	82	72	18.8	28.0	40.5	33.4	29.3
Iowa	354	301	278	280	268	68	64	58	64	54	76	69	66	64	66	13.7	16.8	23.3	20.0	19.4
Kansas	304	296	285	278	259	87	87	94	96	97	89	78	80	76	104	15.9	20.9	30.2	27.4	23.1
Kentucky	247	229	225	216	218	73	78	78	74	66	59	68	80	78	77	13.1	17.7	30.4	26.0	23.0
Louisiana	236	220	238	251	215	66	67	82	87	91	59	45	68	68	64	16.8	17.2	27.0	23.2	20.3
Maine	395	365	375	361	377	94	87	90	89	81	82	83	82	76	72	15.2	18.8	25.9	23.6	22.1
Maryland	349	329	329	347	314	109	104	114	128	119	73	75	78	79	70	18.9	21.9	30.0	28.3	22.0
Massachusetts	468	414	426	421	407	65	61	54	70	67	70	75	66	61	63	11.8	13.3	18.1	15.2	15.4
Michigan	328	288	291	295	287	54	49	53	54	54	64	66	82	75	72	18.6	24.2	39.1	32.6	27.3
Minnesota	313	284	262	273	254	42	42	40	37	39	66	68	76	68	68	12.0	17.5	23.5	21.9	21.6
Missouri	345	302	290	300	278	109	108	104	110	113	71	71	77	73	73	13.8	18.7	28.1	21.5	21.6
Montana	306	295	248	238	232	64	62	58	57	58	126	92	103	94	94	20.2	21.2	36.4	27.7	27.1
Nebraska	295	277	240	235	210	75	68	66	65	66	74	69	65	65	69	16.2	17.7	21.1	20.0	21.3
Nevada	292	319	287	312	264	50	53	49	59	41	186	199	220	175	200	45.4	79.5	97.2	77.4	69.9
New Jersey	411	368	353	359	357	73	69	74	77	68	64	63	66	65	59	16.6	17.5	24.1	22.5	20.4
New Mexico	131	125	117	116	109	46	47	49	47	44	127	86	100	88	85	23.0	30.8	42.0	39.8	38.6
New York	470	415	393	385	367	62	58	60	66	66	61	62	64	62	62	14.4	16.2	19.8	18.0	17.8
North Carolina	171	165	161	152	162	79	82	85	96	82	63	67	72	65	65	19.0	24.1	36.9	27.5	26.2
North Dakota	240	190	208	206	206	54	45	46	44	41	62	49	64	54	52	12.7	16.3	19.2	18.1	14.4
Ohio	356	323	313	315	298	75	77	73	77	76	77	80	89	87	83	19.1	26.1	35.2	29.7	27.7
Oklahoma	198	200	186	163	152	57	56	57	62	55	67	72	63	57	82	13.2	16.8	22.4	19.7	22.2
Pennsylvania	385	352	337	335	324	92	86	84	94	82	55	52	58	57	55	12.6	15.4	19.5	17.2	16.7
Rhode Island	409	374	374	372	363	93	82	97	98	96	67	57	55	51	51	10.5	10.7	12.3	13.2	10.9
South Carolina	137	151	181	203	186	80	89	93	92	89	59	58	79	77	69	16.1	18.0	35.1	31.5	27.9
South Dakota	239	231	215	207	201	54	52	57	48	43	87	68	75	65	55	13.0	15.2	25.3	19.5	21.5
Tennessee	191	182	177	187	174	64	60	65	64	60	68	60	65	62	62	17.1	17.2	23.9	18.6	19.4
Texas	186	183	189	179	166	57	58	63	58	53	78	68	71	69	62	17.8	20.5	30.7	27.0	23.3
Utah	245	244	242	245	233	46	52	50	50	54	92	89	86	84	79	19.6	28.6	37.7	33.2	29.8
Vermont	380	375	361	332	360	84	78	82	77	80	71	52	63	61	66	11.9	12.9	22.4	19.2	22.0
Virginia	221	219	242	247	246	80	78	95	105	85	71	73	89	83	74	19.2	22.7	37.8	31.1	30.2
Washington	339	328	327	345	289	59	62	66	71	64	96	91	102	94	88	20.6	24.7	35.8	30.6	27.3
Wisconsin	327	303	292	296	299	63	53	54	58	57	67	64	73	75	76	13.6	19.0	27.9	24.2	22.8
Wyoming	232	221	219	203	209	70	61	65	53	70	103	105	115	107	113	18.9	30.2	49.9	54.2	47.4
Alaska	193	175	198	208	227	22	29	39	23	28	308	314	203	143	144	6.5	11.8	(1)	(1)	(1)
Hawaii	130	134	135	129	126	50	59	53	67	65	122	107	69	55	48	24.6	21.8	19.8	13.9	14.2
Canal Zone	104					42					403					54.0	-	-		

census. Deaths of soldiers within the States are reported to the registrars and are, therefore, included with civilian deaths.

MORTALITY AND CHANGES IN AGE DISTRIBUTION

For many years there has been discussion of the effect of the changing age distribution of the population upon the crude death rate. The percentage of the total population that is in the older age brackets has been increasing for many years and because these older ages have a general death rate that is five or six times the average for all ages, an increase in their numbers results in a larger crude death rate even when there is no change in age-specific death rates. Such an increase in mortality is obviously spurious.

Since 1940 there has been a large withdrawal from the civilian population of men in the young age groups where the death rate is much below the average for all ages. By 1943 larger numbers of these men had been sent overseas, leaving a population (including those in camps in the United States) with a considerably larger percentage of persons in the older age brackets. Thus, the trend in age distribution which has been in progress in our population for many years was suddenly accelerated by the transfer to foreign countries of large numbers of young adult males in the armed forces. So many young men are involved in this overseas transfer that the sudden acceleration in the trend toward an older population in the continental United States has become an important factor in the crude death rate for 1943.

Considering first the mortality from all causes, the crude death rate for 1943 was 10.87 per 1,000 population, as compared with 10.32 in 1942, 10.43 in 1941, and 10.65 in 1940. Thus the apparent showing is a 2.1-percent excess in mortality in 1943 over 1940. Deaths by age are not available for 1943, but the United States Census Bureau has estimated the populations by age for 1943 and death rates for specific ages are available for 1940. These data are sufficient for making an adjustment in the 1943 rate for the effects of age changes since 1940; the details of the process are explained in a footnote.[1]

[1] The adjustment of the rate for age changes since 1940 is done as follows Death rates for each specific age group in 1940 are multiplied by the 1943 estimated population for that age group to obtain an expected number of deaths at the 1940 age-specific rates. These expected deaths for specific ages are added to get a figure for all ages which is divided by the 1943 estimated population for all ages to obtain an expected death rate in 1943. This expected rate represents the crude death rate that would occur in 1943 if the age-specific death rates were identical with those in 1940. Any difference between this expected rate for all ages for 1943 and the actual rate for all ages in 1940, therefore, represents the result of changes in the age composition of the population since 1940. For example, if the actual 1940 rate for all ages is 95 percent of the expected rate for 1943, it means that the actual observed rate in 1943 can be corrected for age changes by multiplying by 0.95. This multiplier, which is called the "adjustment factor," is obtained as follows:

$$\text{Adjustment factor} = \frac{\text{Actual death rate in 1940 (all ages)}}{\text{Expected death rate in 1943 (all ages)}}$$

Thus if age changes will increase the 1943 crude rate for all ages by 5 percent without any change in the age-specific death rates, the actual crude rate for 1943 must be reduced by approximately that percentage to make it comparable with the 1940 rate. This process eliminates the change in the crude death rate that is due to age changes and indicates what the trend has been when the effects of age changes are eliminated

When this adjustment is made, it is found that the changes in the age distribution of the population between 1940 and 1943 have been sufficient to account for an increase of about 5.4 percent in the crude death rate. The rate for 1943, adjusted to the age distribution of 1940, amounts to 10.32. Thus the increase in the death rate from 10.65 in 1940 to 10.87 in 1943 is more than accounted for by the changes in the age distribution of the population, and the resulting corrected death rate shows a decrease of 3.1 percent in 1943 from the 1940 rate, instead of an increase of 2.1 percent which was indicated by the crude rate.

It is of interest similarly to adjust a few of the major causes of death to see what has been the trend aside from changes that may have occurred because of shifts in age distribution. The crude death rate for heart diseases in 1943 was 324 per 100,000 as compared with 294 in the same States in 1940, an increase of 10.1 percent in the 3-year period. However, adjustment of the 1943 rate for changes in the age distribution since 1940 gives a corrected rate of 307 per 100,000. Thus the increase in the crude death rate of 10.1 percent is cut to an increase of 4.4 percent when adjustment is made for change in age distribution; about half of the increase in the crude death rate from heart diseases since 1940 was due to changes in age distribution.

A similar process applied to cancer indicates that the crude death rate of 125 per 100,000 is reduced to 119 when correction for age is made, which is approximately the rate in these 39 States for 1940. Thus all of the increase in the cancer death rate in these States since 1940 is accounted for by changes in age distribution.

Heart disease and cancer death rates are extremely high in the old age brackets and quite low among young adults. For example, the heart disease death rate among persons over 75 years of age is 155 times the rate at 35–44 years and nearly 350 times the rate at 15–24 years. Thus, the type of change that has been taking place in the age distribution of the population is such as to produce the maximum effect on the crude death rate from heart diseases. In tuberculosis, however, the death rate in the older ages is not so much above that in the young adult ages. The tuberculosis rate above 75 years is only 1.4 times the rate at 25–34 and twice the rate at 15–24. Thus, changes in age distribution would have relatively less effect upon the tuberculosis death rate. The adjustment of the tuberculosis death rate in 1943 by the process outlined above changes only the decimal part of the rate, from 41.4 to 41.1 per 100,000 population; therefore, the death rate of 41 per 100,000 from tuberculosis in 1943 may be compared directly with the rate of 44 in 1940, and presumably the rates for the intervening years also. The rate for 1943 is practically the same as that for 1942; however, since the death rate from tuberculosis

has for many years showed a steady decline, the absence of a decrease in 1943 represents an unfavorable change in the trend of the rate.

Inasmuch as the death rates in this report are provisional, it does not seem worth while to adjust all of them; the above examples are given to indicate that small increases in the rates cannot be interpreted as necessarily indicating any real deterioration in the health of the nation.

INFANT AND MATERNAL MORTALITY

The infant mortality rate, which is based on births and on deaths under 1 year of age, is relatively free from age changes. During 1943 the rate was 40 per 1,000 live births; this was the same as in 1942, but it represented a decline of about 10 percent from the preceding 5-year average. For the first time since 1935 the downward trend of infant mortality was interrupted. The rate in 1935, at that time the low record, was 56 per 1,000 live births, or about 35 percent in excess of the 1942 and 1943 rates. The first three quarters of 1943 showed slight drops from corresponding periods of 1942, but the last quarter increased considerably. For the year as a whole 22 of the 37 reporting States had a lower infant mortality rate in 1943 than in 1942.

The maternal mortality rate declined in each quarter of 1943. The rate of 2.3 per 1,000 live births for a group of 37 States was the lowest recorded in the 14 years of this series of records. Twenty-five of the reporting States had lower maternal mortality rates in 1943 than in 1942, 2 States had the same rate in both years, and in 10 States the rates were higher in 1943 than in 1942.

DISEASES WITH HIGHER RATES IN 1943 THAN IN 1942

The principal diseases having a higher mortality rate in 1943 than in 1942 were cancer, diabetes, heart diseases, intracranial lesions of vascular origin, and nephritis—all diseases of the older ages and subject to some error because of age changes in the population; however, all are diseases which were on the increase in prewar years. In addition, there was a sharp rise in influenza and pneumonia death rates. The influenza rates were higher during each quarter of the year than they were in 1942, but the sharpest rise occurred during the last quarter when the rate for the group of reporting States was 24.4 per 100,000 inhabitants, as compared with 7.9 and 7.0 for corresponding quarters of 1942 and 1941, respectively. Pneumonia death rates in the first and third quarters were not appreciably above preceding years, but in the second and particularly the fourth quarter the rates were considerably above those quarters of 1942 and 1941. The influenza epidemic of December-January 1943–44 has been discussed in other issues of the Public Health Reports.

As already noted, the incidence of meningococcus meningitis reached a new high peak in 1943–44; the death rates were higher during each quarter of 1943 than for corresponding quarters of 1942 and 1941. Although the number of cases was unusually high the death rate was low as compared with rates during previous epidemics of this disease. The average annual death rate in the years 1917–18 was 3.6 per 100,000 population, 4.1 in 1929–30, and 2.1 in 1935–37, which was about the same as the rate for 1943.

The severe outbreak of poliomyelitis that occurred in 1943 was responsible for probably the highest death rate from that disease since 1937, when the rate was slightly more than 1 per 100,000 population. The annual death rate for 1943 was twice that of 1942 and about 60 percent above the average annual rates since 1937. The sharpest increase in the death rate occurred during the third quarter of the year when the seasonal peak of this disease is normally reached; the rate for that quarter was 1.9 as compared with 0.7 and 1.0 for corresponding quarters in 1942 and 1941, respectively. For the years 1916 and 1931, the only years covered by this series of reports in which the cases of poliomyelitis exceeded the reported incidence in 1943, the annual death rates from poliomyelitis were 10.5 and 1.8, respectively.

The whooping cough death rate (2.4 per 100,000 population) was higher in 1943 than in 1942 but slightly lower than in 1941, and compared very favorably with the average rate for the preceding 5 years. Of the 39 reporting States, 28 had a higher death rate from whooping cough in 1943 than in 1942. The declining death rate from this disease during the past 15 years is in contrast with an average annual death rate of 10 per 100,000 persons in the 2 preceding decades.

DISEASES WITH LITTLE OR NO CHANGE IN THE RATES

The death rates from typhoid and paratyphoid fever, dysentery, infectious encephalitis, and syphilis for the 39 reporting States were about the same in 1943 as in 1942, and were all lower than the rates for the three preceding years.

The tuberculosis death rate was approximately the same in 1943 and 1942, 41.4 as compared with 41.7. As already noted, changes in the age distribution of the population since 1940 have had little effect upon the tuberculosis death rate. Considered by quarters, the first and fourth decreased slightly and the second and third increased slightly in 1943 from 1942. Only in the first quarter was the change in the rate as much as 1 per 100,000. For the year as a whole, 19 of the 39 reporting States had a higher death rate from tuberculosis in 1943 than in 1942, 19 had a lower rate, and in 1 State the rate was the same in both years. More than one-half of the States reporting a decline in the death rate are in the South Atlantic and South Central sections,

while about 70 percent of the States showing increases were in the North Atlantic and North Central sections of the country.

DISEASES WITH RATES LOWER IN 1943 THAN IN 1942

The only diseases for which an appreciable decrease in the crude death rate occurred during 1943 were malaria and appendicitis; for each of these the 1943 rate was the lowest on record. For appendicitis 26 of the group of 39 States reported lower rates in 1943 than in 1942, 11 had higher rates, and in 2 States the rate was the same in both years. There was a tendency toward an increase in the malaria death rates in the West North Central and Mountain regions, but the numbers of deaths in these States were too few to be of any statistical significance. In the South Atlantic region there were general decreases in malaria death rates.

ACCIDENT DEATH RATES

The mortality from all accidents, including automobile accidents, was about 3 percent higher in 1943 than in 1942, but for automobile accidents alone the death rate declined about 15 percent. Only 17 of the 39 reporting States showed a decline in the death rate from all accidents, but every State reported a decrease in the automobile accident death rate. While the mortality rate from all accidents was higher in 1943 than in 1942, it was below any of the 3 years preceding 1942. The death rate (52.9) from accidents other than automobile was 10.8 percent above that for 1942 and was the highest in the 5 years included in the table.

DEATHS DURING WEEK ENDED JULY 29, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 29, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	7,695	8,414
Average for 3 prior years	8,207	
Total deaths, first 30 weeks of year	279,877	286,651
Deaths under 1 year of age	573	725
Average for 3 prior years	632	
Deaths under 1 year of age, first 30 weeks of year	18,564	20,288
Data from industrial insurance companies		
Policies in force	66,672,880	65,668,828
Number of death claims	12,833	11,594
Death claims per 1,000 policies in force, annual rate	10.1	9.2
Death claims per 1,000 policies, first 30 weeks of year, annual rate	10.3	10.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 5, 1944

Summary

Increases in the incidence of poliomyelitis occurred during the week in all of the 9 geographic divisions of the country except the East South Central and Mountain areas. Of the total of 932 cases, 807, or 87 percent (approximately the same proportion as that of last week's figures), occurred in the Middle Atlantic, South Atlantic, and East Central sections. With slightly less than 10 percent of the total population, New York reported one-third of the cases. Eleven States with more than 20 cases each reported an aggregate of 760 cases, as follows (last week's figures in parentheses): *Increases*—Massachusetts 23 (8), New York 311 (237), Pennsylvania 86 (64), Ohio 48 (40), Indiana 36 (20), Michigan 40 (30), Maryland 27 (17), Virginia 63 (39), Louisiana 21 (11); *decreases*—North Carolina 40 (57), Kentucky 65 (79).

The total for the past 6 weeks is 3,210, as compared with 1,872 and 2,185, respectively, for the same periods last year and in 1931, the largest numbers previously recorded for the corresponding 6-week period. The peak of weekly incidence of poliomyelitis for the country as a whole has not frequently been reached earlier than the second or third week of September.

A total of 222 cases of typhus fever was reported, as compared with 251 last week, 155 for the corresponding week last year, and a 5-year median of 115. States reporting the largest numbers are Georgia, 58; Texas, 54; Alabama, 41; and Florida, 25.

A decrease occurred in the incidence of meningococcus meningitis from 191 last week to 177. The largest numbers of cases were reported in New York, 24; California, 21; Massachusetts, 12; and Texas, 10. The total cases reported to date this year is 12,786, as compared with 13,183 for the same period last year and a 5-year median of 1,359.

Of a total of 180 cases of typhoid fever, as compared with 163 last week and 291 for the 5-year median, 18 occurred in Texas, 13 in Mississippi, 9 in Michigan, and 8 each in Massachusetts, Illinois, West Virginia, Georgia, and Oklahoma.

In 93 large cities of the United States, a total of 8,125 deaths was registered, as compared with 7,971 last week, and a 3-year (1941–43) average of 7,801. The total to date is 288,008, as compared with 294,930 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 5, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Aug. 5, 1944	Aug. 7, 1943		Aug. 5, 1944	Aug. 7, 1943		Aug. 5, 1944	Aug. 7, 1943		Aug. 5, 1944	Aug. 7, 1943	
NEW ENGLAND												
Maine	0	0	0	1	----	----	5	37	37	0	1	1
New Hampshire	0	0	0	----	----	----	4	3	3	0	1	0
Vermont	0	0	0	----	----	----	7	17	17	0	0	0
Massachusetts	3	2	2	----	----	----	87	114	125	12	12	8
Rhode Island	1	0	0	----	----	----	0	62	18	1	1	0
Connecticut	0	0	0	1	1	1	6	40	22	3	3	1
MIDDLE ATLANTIC												
New York	6	5	7	(1)	1 2	1 2	94	401	234	24	27	6
New Jersey	0	1	1	3	5	2	36	166	117	8	7	0
Pennsylvania	7	7	6	----	----	----	57	55	55	6	19	3
EAST NORTH CENTRAL												
Ohio	4	1	4	1	3	3	12	135	46	6	2	0
Indiana	8	3	4	----	8	2	5	21	10	4	3	0
Illinois	3	7	11	----	7	4	20	120	50	9	18	2
Michigan [2]	10	1	3	----	----	4	57	162	122	6	9	1
Wisconsin	0	4	1	5	----	8	101	239	188	3	5	1
WEST NORTH CENTRAL												
Minnesota	2	2	1	----	----	----	9	32	15	5	0	0
Iowa	3	4	1	----	----	----	13	16	25	0	2	1
Missouri	3	2	2	----	----	----	18	11	8	5	5	2
North Dakota	3	0	1	----	4	2	3	32	2	0	3	0
South Dakota	1	1	1	----	----	----	1	12	3	0	0	0
Nebraska	1	1	0	2	----	----	2	6	3	0	0	0
Kansas	1	2	2	----	1	1	13	15	15	2	3	1
SOUTH ATLANTIC												
Delaware	0	0	0	----	----	----	0	4	1	0	0	0
Maryland [2]	3	3	1	1	2	1	4	31	31	4	4	2
District of Columbia	0	1	1	----	----	----	7	22	5	1	0	0
Virginia	10	7	7	35	75	33	10	48	43	8	7	1
West Virginia	0	2	2	----	----	2	13	9	8	3	1	1
North Carolina	5	9	9	1	3	----	16	11	23	5	3	1
South Carolina	7	4	3	94	207	70	17	21	19	2	2	1
Georgia	5	12	9	6	9	9	5	13	13	3	3	1
Florida	3	3	3	1	4	4	5	3	6	2	2	0
EAST SOUTH CENTRAL												
Kentucky	2	0	5	44	1	1	12	5	5	4	6	2
Tennessee	5	1	2	6	1	6	3	6	9	2	4	2
Alabama	7	12	9	8	17	9	1	7	10	5	3	1
Mississippi [2]	10	1	3	----	----	----	----	----	----	2	1	1
WEST SOUTH CENTRAL												
Arkansas	2	4	4	13	3	3	3	9	7	0	0	0
Louisiana	5	0	3	23	1	2	8	1	2	3	1	0
Oklahoma	4	2	2	6	2	7	3	5	4	0	1	0
Texas	31	18	19	166	190	137	120	54	54	10	5	1
MOUNTAIN												
Montana	2	1	1	3	----	----	2	28	17	0	1	0
Idaho	0	0	0	----	----	----	1	21	4	0	0	0
Wyoming	0	0	1	----	2	2	1	5	5	0	1	0
Colorado	9	1	7	1	7	7	12	13	13	1	0	0
New Mexico	3	1	0	----	----	----	1	4	4	0	0	0
Arizona	3	1	1	14	28	14	10	6	13	0	1	0
Utah [2]	0	0	0	----	----	----	21	22	19	1	0	0
Nevada	0	0	0	5	----	----	14	11	0	0	0	0
PACIFIC												
Washington	5	7	1	1	----	----	46	15	15	3	9	0
Oregon	2	2	1	----	----	2	18	21	21	1	1	0
California	11	10	10	4	22	20	335	151	151	21	24	1
Total	190	145	164	445	605	369	1,238	2,251	2,246	177	201	33
31 weeks	6,362	6,888	7,280	337,734	80,678	151,020	589,042	533,746	464,760	12,786	13,183	1,359

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended August 5, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis: Week ended—Aug. 5, 1944	Poliomyelitis: Week ended—Aug. 7, 1943	Poliomyelitis: Median 1939–43	Scarlet fever: Week ended—Aug. 5, 1944	Scarlet fever: Week ended—Aug. 7, 1943	Scarlet fever: Median 1939–43	Smallpox: Week ended—Aug. 5, 1944	Smallpox: Week ended—Aug. 7, 1943	Smallpox: Median 1939–43	Typhoid and paratyphoid fever[3]: Week ended—Aug. 5, 1944	Typhoid and paratyphoid fever[3]: Week ended—Aug. 7, 1943	Typhoid and paratyphoid fever[3]: Median 1939–43
NEW ENGLAND												
Maine	1	6	1	10	8	8	0	0	0	1	0	2
New Hampshire	1	0	0	2	1	1	0	0	0	0	0	0
Vermont	1	2	0	8	2	2	0	0	0	0	0	0
Massachusetts	23	0	1	54	53	49	0	0	0	8	5	4
Rhode Island	0	6	0	0	3	2	0	0	0	2	1	0
Connecticut	10	24	2	12	11	7	0	0	0	0	1	3
MIDDLE ATLANTIC												
New York	311	18	12	83	79	73	0	0	0	4	9	11
New Jersey	16	1	3	24	7	20	0	0	0	2	3	4
Pennsylvania	86	1	3	59	47	48	0	0	0	3	10	13
EAST NORTH CENTRAL												
Ohio	48	6	9	58	55	50	0	0	0	7	22	17
Indiana	36	1	2	19	11	9	0	0	0	6	1	1
Illinois	14	34	13	38	25	41	0	2	2	8	7	20
Michigan[2]	40	4	8	42	12	44	0	0	1	9	6	4
Wisconsin	5	1	0	62	27	37	0	0	0	0	2	1
WEST NORTH CENTRAL												
Minnesota	14	6	3	18	10	11	0	0	0	0	1	1
Iowa	1	1	1	16	18	11	0	0	1	1	1	3
Missouri	4	7	4	11	14	14	0	0	0	2	17	13
North Dakota	0	0	0	1	0	3	0	0	0	0	1	0
South Dakota	0	1	1	5	6	6	0	0	1	1	1	0
Nebraska	4	3	3	6	6	3	0	0	0	0	1	0
Kansas	5	43	4	11	10	10	0	0	0	4	3	5
SOUTH ATLANTIC												
Delaware	3	0	0	3	2	1	0	0	0	0	0	0
Maryland[2]	27	0	0	12	14	11	0	0	0	2	0	8
District of Columbia	9	0	0	4	4	4	0	0	0	0	0	0
Virginia	63	2	2	19	6	6	0	0	0	3	7	10
West Virginia	7	0	1	21	17	13	0	0	0	8	6	6
North Carolina	40	2	2	21	17	17	0	0	0	7	6	10
South Carolina	4	0	2	3	8	2	0	0	0	3	10	10
Georgia	7	1	1	9	11	10	0	0	0	8	19	19
Florida	7	0	1	2	4	2	0	0	0	2	2	3
EAST SOUTH CENTRAL												
Kentucky	65	8	7	10	11	16	0	0	0	8	16	14
Tennessee	4	0	3	14	9	9	0	0	0	6	6	11
Alabama	5	1	1	7	9	13	0	0	0	6	5	7
Mississippi[2]	10	2	1	1	3	5	0	0	0	13	9	13
WEST SOUTH CENTRAL												
Arkansas	0	4	4	2	6	4	0	0	0	5	4	20
Louisiana	21	4	4	5	1	5	0	0	0	6	6	10
Oklahoma	1	52	0	2	2	8	0	0	0	8	11	11
Texas	5	62	7	19	18	14	0	0	0	18	17	32
MOUNTAIN												
Montana	0	0	0	14	4	3	0	0	0	0	0	1
Idaho	0	0	0	1	33	1	1	0	0	1	0	0
Wyoming	0	0	0	2	9	1	0	0	0	0	1	1
Colorado	0	15	1	17	10	8	0	0	0	3	1	1
New Mexico	2	5	1	6	0	1	0	0	0	3	3	3
Arizona	1	1	1	2	3	2	0	0	0	0	2	2
Utah[2]	1	6	1	14	7	3	0	0	0	0	0	2
Nevada	0	2	0	0	1	0	0	0	0	1	0	0
PACIFIC												
Washington	5	5	1	22	24	8	0	0	0	2	2	2
Oregon	16	8	1	6	7	7	0	0	0	4	2	2
California	9	11	20	66	99	40	0	0	0	5	5	10
Total	932	450	210	843	744	705	1	2	6	180	232	291
31 weeks	3,992	2,766	1,535	146,231	96,206	96,206	288	600	1,170	2,928	2,893	3,840

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended August 5, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough			Week ended August 5 1944								
	Week ended—		Me dian 1939-43	An thrax	Dysentery			En ceph alitis infec tious	Lep rosy	Rocky Mt spot ted fever	Tula remia	Ty phus fever
	Aug 5 1944	Aug 7, 1943			Ame bic	Bacil lary	Un speci fied					
NEW ENGLAND												
Maine	15	16	23	0	0	0	0	0	0	0	0	0
New Hampshire	0	2	2	0	0	0	0	0	0	0	0	0
Vermont	25	19	19	0	0	0	0	0	0	0	0	0
Massachusetts	58	53	115	0	0	0	0	0	0	0	0	0
Rhode Island	2	35	15	0	0	0	0	0	0	0	0	0
Connecticut	45	33	49	0	0	0	0	1	0	0	0	0
MIDDLE ATLANTIC												
New York	160	249	311	0	4	9	0	3	0	2	0	1
New Jersey	79	149	149	0	0	0	0	0	0	3	0	0
Pennsylvania	91	228	257	1	0	0	0	0	0	2	0	0
EAST NORTH CENTRAL												
Ohio	166	252	260	0	0	0	0	1	0	0	0	0
Indiana	24	42	42	0	0	0	0	1	0	0	0	0
Illinois	109	195	195	0	0	0	0	3	0	1	0	0
Michigan [1]	99	257	257	0	3	4	0	0	0	0	0	0
Wisconsin	151	322	225	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	15	110	53	0	0	0	0	1	0	0	0	0
Iowa	8	41	36	0	0	0	0	0	0	0	0	0
Missouri	19	40	36	0	0	0	2	0	0	0	1	0
North Dakota	3	21	11	0	0	0	0	6	0	0	0	0
South Dakota	22	3	3	0	0	0	0	0	0	0	0	0
Nebraska	9	7	7	0	0	0	0	0	0	0	0	0
Kansas	23	59	57	0	0	1	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	0	2	0	0	0	0	0	0	2	0	0
Maryland [2]	112	108	84	0	0	0	6	0	0	1	0	0
District of Columbia	0	28	24	0	0	0	0	1	0	0	0	0
Virginia	70	72	56	0	0	0	273	0	0	10	0	0
West Virginia	41	84	27	0	0	0	0	0	0	3	0	0
North Carolina	203	199	111	0	0	0	0	0	0	7	0	16
South Carolina	84	115	52	0	0	24	0	0	0	0	2	11
Georgia	20	20	20	0	0	6	0	0	0	2	0	58
Florida	5	11	11	0	1	1	0	0	0	0	0	25
EAST SOUTH CENTRAL												
Kentucky	106	33	61	0	0	0	0	0	0	0	2	0
Tennessee	28	50	50	1	0	0	8	0	0	3	0	2
Alabama	22	35	22	0	1	0	0	1	0	0	0	41
Mississippi [2]				0	0	0	0	0	0	0	0	4
WEST SOUTH CENTRAL												
Arkansas	10	39	8	0	0	47	0	0	0	0	2	0
Louisiana	2	5	7	0	3	5	0	0	1	1	0	8
Oklahoma	3	5	7	0	0	0	0	0	0	1	0	0
Texas	178	245	134	0	31	530	0	1	0	0	1	54
MOUNTAIN												
Montana	35	17	17	0	0	0	0	0	0	0	1	0
Idaho	2	6	7	0	0	0	0	0	0	0	0	0
Wyoming	14	6	6	0	0	0	0	0	0	1	3	0
Colorado	21	72	30	0	0	0	0	0	0	0	0	0
New Mexico	3	0	15	0	0	6	4	0	0	0	0	0
Arizona	14	15	15	0	0	2	28	0	0	0	0	0
Utah [2]	63	84	53	0	0	0	0	0	0	0	0	0
Nevada	1	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	22	35	59	0	0	0	0	0	0	0	0	0
Oregon	12	44	19	0	0	0	0	0	0	0	0	0
California	75	182	185	0	2	9	0	0	0	0	0	2
Total	2 270	3 643	3 673	2	46	644	321	19	1	39	12	222
Same week, 1943	3 643			2	44	568	356	22	1	21	16	155
Same week, 1942	3 413			1	27	259	428	14	2	41	22	115
31 weeks, 1944	58 834			26	1,000	12,724	4,585	350	18	323	367	2,801
31 weeks, 1943	125 517			39	1,269	9,254	3,882	376	18	298	564	1,923
31 weeks, 1942	116 280		[4] 120 862	55	652	4,928	3,749	280	34	[4] 331	613	[4] 1,307

[1] New York City only
[2] Period ended earlier than Saturday
[3] Including paratyphoid fever cases reported separately as follows Maine, 1 Massachusetts, 7, New York, 1 Illinois, 1, Michigan, 4 South Carolina, 1, Georgia, 2, Florida, 1, Tennessee, 1, Arkansas, 1, California, 1
[4] 5-year median 1939-43

WEEKLY REPORTS FROM CITIES

City reports for week ended July 22, 1944

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0	0	0	0	0	1	0	0	0
New Hampshire:												
Concord	0	0		0	1	0	0	0	0	0	1	0
Massachusetts:												
Boston	1	0		0	57	4	8	2	9	0	1	25
Fall River	0	0		0	0	0	1	0	0	0	0	1
Springfield	0	0		0	6	1	0	3	2	0	0	14
Worcester	0	0		0	1	0	7	0	2	0	0	11
Rhode Island:												
Providence	0	0		0	8	0	2	0	0	0	0	4
Connecticut:												
Bridgeport	0	0		0	0	2	1	0	0	0	0	0
Hartford	0	0		0	1	0	1	0	1	0	0	0
New Haven	0	0	1	0	3	0	1	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	1	4	6	30	2	0	0	0
New York	6	0		0	36	15	31	25	22	0	4	62
Rochester	0	0		0	25	3	1	5	4	0	0	0
Syracuse	0	0		0	2	0	1	1	1	0	0	14
New Jersey:												
Camden	0	0		0	0	0	0	0	0	0	0	1
Newark	0	0		0	19	0	1	0	1	0	0	10
Trenton	0	0		0	0	0	2	0	0	0	0	1
Pennsylvania:												
Philadelphia	1	0	1	1	5	3	17	3	17	0	1	11
Pittsburgh	1	0		0	2	3	7	10	2	0	0	5
Reading	0	0		0	1	0	0	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0		0	2	1	3	6	7	0	0	11
Cleveland	0	0		0	6	3	8	10	8	0	0	13
Columbus	0	0		0	1	0	1	2	2	0	3	35
Indiana:												
Fort Wayne	0	0		0	0	0	2	0	0	0	0	0
Indianapolis	5	0		0	1	1	0	1	1	0	0	11
South Bend	0	0		0	0	0	0	0	0	0	0	0
Terre Haute	0	0		0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	1	0	1	2	28	2	13	4	14	0	0	34
Springfield	0	0		0	0	0	0	0	0	0	0	0
Michigan:												
Detroit	3	0		0	26	5	10	7	14	0	0	44
Flint	0	0		0	0	0	0	1	0	0	0	7
Grand Rapids	0	0		0	0	0	1	0	1	0	0	0
Wisconsin:												
Kenosha	0	0		0	6	0	0	0	1	0	0	45
Milwaukee	1	0	1	1	25	1	2	1	10	0	0	36
Racine	0	0		0	29	0	0	0	2	0	0	8
Superior	0	0		0	1	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0		0	21	1	0	0	5	0	0	0
Minneapolis	0	0		0	4	1	0	1	7	0	0	6
St. Paul	0	0		0	3	0	3	1	1	0	0	27
Missouri:												
Kansas City	3	0		0	0	0	6	0	1	0	0	0
St. Joseph	0	0		0	0	0	0	0	0	0	0	0
St. Louis	0	1		0	1	2	10	2	8	0	1	39

City reports for week ended July 22, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	0	0	0	3	0	0	0	0
Nebraska:												
Omaha	0	0		0	3	1	1	1	3	0	0	0
Kansas:												
Topeka	0	0		0	5	0	2	0	0	0	0	10
Wichita	0	0		0	0	0	0	0	0	0	0	12
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	1	0	0	0	0	1
Maryland:												
Baltimore	1	0		0	2	2	4	1	11	0	1	108
Cumberland	0	0		0	0	1	0	0	1	0	0	1
Frederick	1	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0		0	9	1	3	8	3	0	0	2
Virginia:												
Lynchburg	0	0		0	0	0	1	4	1	0	0	0
Richmond	0	0		0		0	1	2	2	0	1	0
Roanoke	0	0		0	1	0	0	1	1	0	1	5
West Virginia:												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	0	0	0	0	2	1
Wilmington	0	0		0	2	0	0	1	0	0	0	18
Winston-Salem	0	0		0	0	0	3	0	4	0	0	9
South Carolina:												
Charleston	0	0		0	1	1	0	1	2	0	0	0
Georgia:												
Atlanta	0	0		0	0	0	2	0	1	0	0	0
Brunswick	0	0		0	1	0	0	0	0	[illegible]	1	0
Savannah	0	0		0	0	0	0	0	1	0	0	0
Florida:												
Tampa	1	0		0	1	0	2	1	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	0	2	8	0	1	0	0	20
Nashville	0	0		0	2	0	1	0	0	0	0	0
Alabama:												
Birmingham	0	0	1	0	0	0	1	0	0	0	0	1
Mobile	0	0		0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	1	0	0	0	0	8
Louisiana:												
New Orleans	1	0		1	3	0	5	9	0	0	1	0
Shreveport	0	0		0	2	0	6	1	0	0	11	0
Texas:												
Dallas	1	0		0	0	0	0	0	2	0	0	12
Galveston	0	0		0	0	0	0	0	0	0	0	0
Houston	1	0		0	0	0	5	2	0	0	1	0
San Antonio	0	0		1	0	0	6	0	2	0	1	3
MOUNTAIN												
Montana:												
Billings	0	0		0	1	0	2	0	0	0	0	2
Great Falls	0	0		0	0	0	0	0	1	0	0	0
Helena	0	0		0	0	0	0	1	1	0	0	0
Missoula	0	0		0	0	1	0	0	0	0	0	5
Idaho:												
Boise	0	0		0	0	0	1	0	0	0	0	0
Colorado:												
Denver	2	0		0	1	0	2	0	1	0	0	15
Pueblo	0	0		0	0	0	1	0	1	0	0	2
Utah:												
Salt Lake City	0	0		0	4	0	2	0	5	0	0	9

City reports for week ended July 22, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	0	0	------	1	13	0	2	0	4	0	0	0
Spokane	1	0	----	0	1	0	0	0	2	0	0	0
Tacoma	1	0	----	0	1	0	1	0	9	0	1	4
California:												
Los Angeles	8	0	----	0	45	3	2	1	16	0	1	10
Sacramento	0	1	-	0	12	1	1	2	6	0	0	---
San Francisco	1	0		0	44	0	14	0	9	0	0	7
Total	42	2	5	7	476	65	228	155	233	0	33	730
Corresponding week, 1943	37		29	8	1,183	---	247	-----	246	2	28	1,277
Average, 1939-43	45	--	29	[1] 6	[2] 1,021	-----	[2] 237	-----	266	1	36	1,281

[1] 3-year average, 1941-43.
[2] 5-year median.

Dysentery, amebic.—Cases: New York, 1; Los Angeles, 2.
Dysentery, bacillary.—Cases: Worcester, 4; Buffalo, 2, New York, 1; Baltimore, 2; Richmond, 1; Charleston, S. C., 33; Atlanta, 1; Memphis, 1; Nashville, 2; Dallas, 1; Los Angeles, 3.
Dysentery, unspecified.—Cases: Chicago, 1; Baltimore, 2.
Leprosy—Cases: Cleveland, 1.
Rocky Mountain spotted fever, infectious.—Cases: New York, 1.
Tularemia.—Cases: Richmond, 1; Memphis, 1.
Typhus fever, endemic.—Cases: Brunswick, 2; Savannah, 2; Tampa, 6; Birmingham, 3; Mobile, 7; New Orleans, 2; Shreveport, 1; Galveston, 1; Houston, 3: San Antonio, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,385,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	2.6	0 0	2.6	0 0	202	18.4	55.1	13.1	39	0.0	5.3	147
Middle Atlantic	3 7	0.0	0.5	0.5	42	13.0	30.5	34.7	23	0.0	2.3	48
East North Central	6.1	0.0	1.2	1.8	76	7.9	24.3	19.5	37	0.0	1.8	148
West North Central	8.0	2 0	0 0	0.0	74	9.9	43.8	15.9	40	0.0	2.0	167
South Atlantic	4.9	0.0	0.0	0.0	28	8.2	27 8	31.1	46	0.0	9.8	235
East South Central	0.0	0 0	5.9	0.0	12	11.8	64.9	0.0	6	0.0	0.0	124
West South Central	8.6	0 0	0 0	5.7	14	0.0	65.9	34.4	11	0.0	40.2	66
Mountain	15.9	0.0	0.0	0.0	48	7.9	63.5	7.9	71	0.0	0.0	262
Pacific	17.4	1.6	0 0	1.6	183	6.3	31.6	4.7	73	0.0	3.2	33
Total	6.4	0.3	0.8	1.1	72	9.9	34 7	23.6	35	0.0	5 0	111

PLAGUE INFECTION IN SAN LUIS OBISPO COUNTY, CALIF.

Plague infection has been reported proved in a pool of 615 fleas from 32 ground squirrels, *C. beecheyi*, taken June 22 from a ranch 3 miles north and 10 miles east of Santa Maria, San Luis Obispo County, Calif.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—Two rats found in the Paauhau area, Honokaa, Hamakua District, Island of Hawaii, T. H., were proved positive for plague on July 3, 1944.

Puerto Rico

Notifiable diseases—4 weeks ended July 15, 1944.—During the 4 weeks ended July 15, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Ophthalmia neonatorum	4
Chickenpox	80	Poliomyelitis	1
Diphtheria	45	Syphilis	1 063
Dysentery	15	Tetanus	3
Filariasis	4	Tetanus, infantile	1
German measles	1	Tuberculosis (all forms)	84[illegible]
Gonorrhea	529	Typhoid fever	3[illegible]
Influenza	42	Typhus fever (endemic)	5[illegible]
Malaria	639	Undulant fever	2
Measles	36	Whooping cough	8[illegible]

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 8, 1944.—During the week ended July 8, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		24	2	30	204	36	16	68	51	431
Diphtheria		2	1	40	1	7				51
Dysentery (bacillary)				4		2				6
Encephalitis, infectious				1						1
German measles		2		23	45	2	16	5	27	120
Influenza		12			4		1		1	18
Measles		5	12	283	197	66	52	38	24	677
Meningitis, meningococcus		1		3	1				1	
Mumps				31	66	11	7	36	12	163
Poliomyelitis				1	4			2		7
Scarlet fever		3	3	31	86	16	9	23	35	206
Tuberculosis (all forms)		4	6	113	55	27	1	15	26	247
Typhoid and paratyphoid fever				29						29
Undulant fever				12	1					13
Whooping cough		10		75	19	2	7	14	18	145

PERU

Infectious diseases—1939–43—Comparative—For the years 1939 to 1943, inclusive, the following numbers of cases of certain infectious diseases were reported in Peru

Disease	1939	1940	1941	1942	1943
Cerebrospinal meningitis	12	48	57	27	43
Diphtheria	350	797	715	621	842
Dysentery (unspecified)	5,259	6,143	6,852	6,289	6,221
Encephalitis	6	13	3	2	7
Influenza	15,083	40,205	23,226	19,753	24,343
Leprosy	24	44	11	4	3
Malaria	57,066	46,289	56,778	37,331	42,267
Measles	3,649	3,074	3,375	6,830	2,568
Plague	140	182	67	98	66
Poliomyelitis	29	78	24	22	116
Recurrent fever	508	48	274	389	81
Scarlet fever	264	282	422	341	413
Smallpox	173	371	3,131	2,499	1,826
Typhoid fever	3,547	3,233	4,063	4,148	3,350
Typhus fever	1,659	1,255	1,921	2,010	1,408
Undulant fever	140	108	136	583	667
Whooping cough	9,916	17,625	15,016	12,219	12,391
Yellow fever	1				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

India—Calcutta.—Cholera has been reported in Calcutta, India, as follows: Week ended July 8, 1944, 41 cases, 20 deaths; week ended July 15, 1944, 49 cases, 25 deaths.

Plague

Egypt.—For the week ended July 15, 1944, 1 case of plague was reported in Ismailiya, and 1 case of plague was reported in Serapeum, Egypt.

French West Africa—Dakar.—Presumably from the beginning of the outbreak in April up to July 25, 1944, 102 cases of plague with 84 deaths were reported in Dakar, French West Africa.

Indochina.—For the period June 21–30, 1944, 3 cases of plague were reported in Indochina.

Madagascar.—For the period May 11–31, 1944, 2 cases of plague were reported in Madagascar.

Morocco—Rabat region.—From the beginning of the outbreak in May 1944 up to June 30, 1944, a total of 70 cases of plague with 40 deaths were reported in Rabat region, Morocco.

Peru.—For the month of May 1944, plague has been reported in Peru by Departments, as follows: Ancash—20 confirmed cases and 24 suspected cases; Lambayeque—1 case; Piura—1 case.

Smallpox

India—Calcutta.—For the week ended July 8, 1944, 103 cases of smallpox with 82 deaths were reported in Calcutta, India, and for the week ended July 15, 1944, 108 cases of smallpox and 88 deaths were reported in the same place.

Indochina.—For the period June 21–30, 1944, 35 cases of smallpox were reported in Indochina.

Italy—Palermo.—For the month of June 1944, 133 cases of smallpox were reported in Palermo, Italy.

Mexico—Torreon.—According to a report dated July 20, 1944, smallpox is said to have reappeared in the vicinity of Torreon, Mexico, with 7 cases and 1 death reported in a collective farming community.

Peru.—During the month of May 1944, 48 cases of smallpox were reported in Peru. Departments reporting the highest incidence of the disease are Huancavelica 15, Junin 12, and Puno 20.

Venezuela.—During the month of June 1944, 47 cases of smallpox with 3 deaths were reported in Venezuela, including 36 cases with 3 deaths reported in Caracas.

Typhus Fever

Algeria.—For the period June 21–30, 1944, 30 cases of typhus fever were reported in Algeria.

Ecuador.—For the period May 1–15, 1944, 16 cases of typhus fever with 2 deaths were reported in Ecuador, including 12 cases and 2 deaths reported in Quito.

Egypt.—For the week ended July 1, 1944, 485 cases of typhus fever with 80 deaths were reported in all of Egypt.

Guatemala.—For the month of June 1944, 176 cases of typhus fever with 41 deaths were reported in Guatemala. The Departments reporting the highest incidence of the disease are; Alta Verapaz, 66 cases, 4 deaths; Huehuetenango, 28 cases, 11 deaths; Quezaltenango, 37 cases, 7 deaths.

Hungary.—For the period June 18–30, 1944, 201 cases of typhus fever (124 cases in Subcarpathia) were reported in Hungary.

Indochina.—For the period June 21–30, 1944, 25 cases of typhus fever were reported in Indochina.

Peru.—For the month of May 1944, 129 cases of typhus fever were reported in Peru. Departments reporting the highest incidence are as follows: Apurimac, 21; Cuzco, 33; and Junin, 38.

Slovakia.—For the period June 18–30, 1944, 7 cases of typhus fever were reported in Slovakia.

Venezuela.—During the month of June 1944, 12 cases of typhus fever with 1 death were reported in Venezuela.

Yugoslavia.—For the period May 22–June 7, 1944, 1,290 cases of typhus fever were reported in Yugoslavia.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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STUDIES ON THE DURATION OF DISABLING SICKNESS

V. Frequency of Short-term Absences and Its Relation to Total Frequency[1]

By W M. GAFAFER, *Principal Statistician*, and ROSEDITH SITGREAVES, *Junior Statistician, United States Public Health Service*

The short-term absence now generally defined as lasting less than 4 days is the subject of the present inquiry, the fifth of a series (*1–4*). [illegible]es of short duration are of particular interest from the standpoint [illegible]ation, since it is recognized that the sicknesses generally responding most readily to control efforts are the minor disabilities in which a number of psychological factors as well as physical ill-health may be involved (*5*). Furthermore, there is a notable paucity of published quantitative material on the time changes in the behavior of short-term absences, reference being made particularly to seasonal variation. The investigation will concern itself principally with the ratio of the frequency of short-term absences to the frequency of all sick absences. More specifically, two relationships will be considered: first, the variation of the ratio with time for specific quarter years, and second, the correlation of the ratio with the frequency of all sick absences without losing the identity of the quarter years yielding the frequencies.

With regard to causes of sickness, attention will be directed to those absences for which a respiratory disease was recorded, since the frequency of absences due to the respiratory group presents a relatively wide variation with time. Indeed, as is well known, the periodicity characterizing the variation of the frequency of all sick absences is determined by the periodicity of the respiratory group of diseases. Moreover, a similar periodicity is shown by the frequency of short-term absences as well as by the absences of 4 days or longer for both all sickness and the respiratory group of diseases.

[1] From the Industrial Hygiene Division, Bureau of State Services. For earlier papers in the series, see references *1–4*.

The supporting data have been derived from the recorded disability experience of a public utility company[3] and cover the 10 years 1933–42. During this period approximately 26,000 male-years of exposure yielded 22,704 absences due to sickness lasting 1 calendar day or longer; of these, 12,846, or 57 percent, lasted less than 4 days. With reference to the age distribution of the exposed population it may be noted that during the years 1933–40 approximately 50 percent of the males were under 40 years of age, the percentage decreasing to 46 in 1941 and to 42 in 1942.

FREQUENCY OF SHORT-TERM ABSENCES

Table 1 presents among other things the average annual number of absences per 1,000 males due to sickness and respiratory diseases disabling for 1 to 3 days, and 1 day or longer, according to quarter-year in which absence began.

For all sickness the rates for short-term absences range in value from 251.2 per 1,000 males in the third quarter of 1940 to 855.8 per 1,000 in the first quarter of 1939, the mean of the 40 quarters for the 10 years being 488.7. For the respiratory diseases, on the other hand, the rates range from 102.7 in the third quarter of 1941 to 670.5 in the first quarter of 1939, the corresponding mean being 308.2. On the average the respiratory diseases contribute 63 percent of all sick absences of 1 to 3 days and approximately the same proportion of sick absences of all durations.

An examination of the table reveals a number of interesting relationships in the quarterly variation of the rates for short-term absences and those of all durations which hold for both the all sickness and respiratory groups. These relationships may be conveniently summarized as follows:

(1) In general, in any year, for both the 1 to 3 day absences and those of 1 day or longer, the highest frequency occurs in the first quarter, the second highest in the fourth quarter, the third highest in the second quarter, and the lowest in the third quarter. Thus the periodicity of the movement of the frequencies is apparent.

(2) If the 40 rates for a particular one of the 4 classifications are related to their mean it will be found that all of the first quarter rates show excesses, all of the second and third quarter rates show defects, and the fourth quarter rates show both excesses and defects.

(3) With only 3 exceptions, namely, the first quarters of 1933, 1937, and 1941, the short-term absences contribute over half of the total frequency in any quarter. Hence, in general, the frequencies of the short-term absences are higher than the corresponding frequencies of the longer absences.

[3] The present report constitutes the ninth paper based on data from this company. A list of the earlier papers will be found in reference 6, the eighth paper of the series.

TABLE [illegible].—*Ratio of the frequency of short-term absences (1–3 calendar days) to the frequency of all absences (1 calendar day or longer) for all sickness and the respiratory diseases, according to quarter-year in which absence began; experience of male employees in a public utility, 1933–42, inclusive*

Quarter-year in which absence began	All sickness: Average annual number of absences per 1,000 males — A: Short-term absences (1–3 days)	All sickness: Average annual number of absences per 1,000 males — B: All absences (1 day or longer)	All sickness: Ratio A to B	Respiratory diseases: Average annual number of absences per 1,000 males — A′: Short-term absences (1–3 days)	Respiratory diseases: Average annual number of absences per 1,000 males — B′: All absences (1 day or longer)	Respiratory diseases: Ratio A′ to B′	Average number of males
1933							
First	612.8	1,365.0	0.45	457.6	1,118.0	0.41	2,561
Second	291.0	495.5	.59	160.4	267.4	.60	2,550
Third	284.3	452.7	.63	131.3	219.4	.60	2,568
Fourth	492.3	896.4	.55	338.4	615.3	.55	2,579
1934							
First	770.5	1,402.3	.55	572.0	1,087.2	.53	2,574
Second	429.3	680.0	.63	203.7	340.0	.60	2,560
Third	309.5	528.8	.59	143.1	247.3	.58	2,551
Fourth	503.7	865.5	.58	316.6	558.3	.57	2,544
1935							
First	678.6	1,334.9	.51	506.6	990.8	.51	2,546
Second	388.3	726.1	.53	219.4	391.5	.56	2,541
Third	283.8	488.6	.58	116.3	198.5	.59	2,558
Fourth	479.7	795.3	.60	297.1	484.3	.61	2,564
1936							
First	654.4	1,188.6	.55	446.7	848.1	.53	2,575
Second	371.5	673.4	.55	195.0	357.6	.55	2,598
Third	365.3	563.1	.65	190.3	270.9	.70	2,614
Fourth	502.4	879.5	.57	334.9	580.8	.58	2,637
1937							
First	691.2	1,498.7	.46	530.6	1,203.5	.44	2,652
Second	372.5	631.3	.59	190.0	327.6	.58	2,681
Third	352.9	563.2	.63	136.8	219.1	.62	2,698
Fourth	444.2	761.7	.58	257.8	444.2	.58	2,724
1938							
First	629.2	1,179.6	.53	419.0	805.9	.52	2,778
Second	371.3	634.7	.59	185.7	333.9	.56	2,787
Third	315.4	540.9	.58	152.7	269.7	.57	2,780
Fourth	595.2	991.5	.60	383.5	631.0	.61	2,773
1939							
First	855.8	1,626.3	.53	670.5	1,283.7	.52	2,758
Second	423.5	763.5	.55	244.7	444.0	.55	2,737
Third	374.7	563.5	.66	162.7	223.7	.73	2,732
Fourth	563.7	894.3	.63	375.8	559.3	.67	2,724
1940							
First	735.3	1,362.4	.54	532.2	966.6	.55	2,713
Second	380.3	719.1	.53	182.7	344.7	.53	2,707
Third	251.2	440.7	.57	126.3	199.8	.63	2,708
Fourth	404.6	719.2	.56	265.8	462.2	.58	2,694
1941							
First	738.5	1,567.0	.47	585.4	1,293.8	.45	2,702
Second	326.3	548.8	.59	176.5	280.3	.63	2,704
Third	287.5	440.0	.65	102.7	155.5	.66	2,705
Fourth	451.6	737.0	.61	297.2	463.4	.64	2,697
1942							
First	830.4	1,351.9	.61	622.4	980.3	.63	2,652
Second	462.6	741.1	.62	262.8	379.2	.69	2,549
Third	476.5	701.1	.68	271.1	378.6	.72	2,473
Fourth	797.7	1,229.9	.65	565.8	855.7	.66	2,825

(4) For both the short-term absences and those of 1 day or longer the rates for the third and fourth quarters of 1942 are the highest third and fourth quarter rates of the 10 years, each rate being over 30 percent in excess of its respective 10-year mean.

(5) For absences of short duration the 5 highest first-quarter rates are found in 1934, 1939, 1940, 1941, and 1942; for absences of all durations the 5 highest first-quarter rates occur in 1933, 1934, 1937, 1939, and 1941.

RATIO OF THE FREQUENCY OF SHORT-TERM ABSENCES TO THE TOTAL FREQUENCY

The ratios of the frequency of short-term absences to the corresponding total frequency for each quarter and year, given in table 1

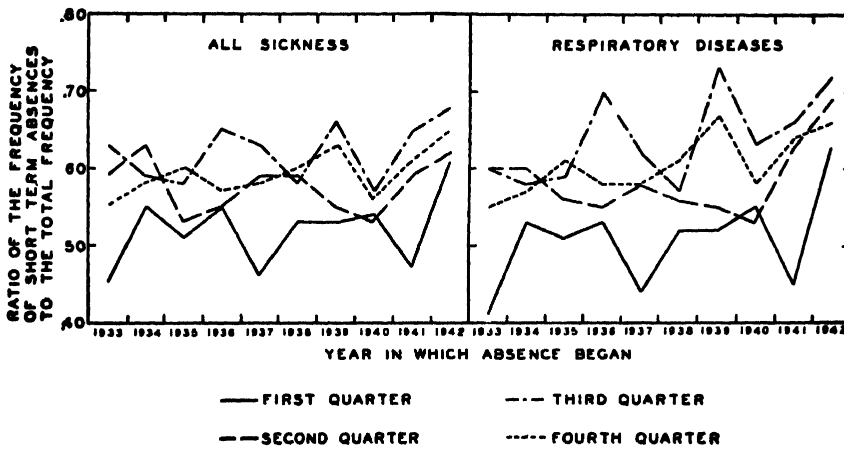

FIGURE 1.—Ratio of the frequency of short-term absences (1–3 calendar days) to the frequency of all absences (1 calendar day or longer) due to (a) all sickness and (b) the respiratory diseases, according to quarter-year in which absence began experience of male employees in a public utility, 1933–42, inclusive

for all sickness and the respiratory diseases, are presented graphically in figure 1.

All sickness.—If the ratios for all sickness are examined it will be found that they vary from 0.45 to 0.68, their mean being 0.58. In any year the lowest ratio is generally found in the first quarter while the highest ratio tends to occur in the third, the means of the 10 ratios for each quarter being 0.52 for the first, 0.58 for the second, 0.62 for the third, and 0.60 for the fourth. It is a striking fact that the high total frequencies regularly appearing in the first quarter of each year are associated with relatively small proportions of short term absences while the low total frequencies occurring in the third quarters are made up of relatively large proportions of such absences. Furthermore, it will be observed that the first quarters of 1933, 1937, and 1941, yielding total frequencies sufficiently high to be considered

epidemic in character, show the 3 lowest ratios of the 40 quarters, and are the only ones which are less than 0.50.

In general the ratios for each quarter show a slight upward trend over the 10 years, the ratios for the 4 quarters of 1942 being unusually high. For the first, third, and fourth quarters of this year the ratio of the frequency of short-term absences to the total frequency is higher than for any other year of the period under study, while the 1942 second-quarter ratio is surpassed only by the one for 1934.

Respiratory diseases.—The 40 ratios for the respiratory diseases, ranging in value from 0.41 to 0.73, show more variation than the ratios for all sickness but their mean value is the same, namely, 0.58. For the 4 quarters the respective 10-year means become 0.51 for the first, 0.58 for the second, 0.64 for the third, and 0.61 for the fourth, and these values are of the same order of magnitude as the corresponding means for all sickness. Again it will be observed that the first quarters, consistently associated with high frequency rates, reveal relatively low proportions of short-term absences while relatively high proportions of such absences occur in the third quarters where markedly low frequency rates are found. Furthermore, the highest total respiratory disease frequency of the 40 quarters (1,293.8 in the first quarter of 1941) yields 1 of the 3 ratios which are less than 0.50, the other 2 occurring in the epidemic first quarters of 1933 and 1937.

The trend of the respiratory disease ratios for each quarter over the 10-year period appears to be increasing, the year 1942 yielding the highest first and second quarter ratios of the 10 years while the third and fourth quarter ratios for that year are surpassed only by the corresponding ratios for 1939.

CORRELATION OF THE RATIO WITH THE TOTAL FREQUENCY

All sickness.—To investigate further the relationship between the proportion of short-term absences and the magnitude of the total frequency, figure 2 presents an appropriate scatter diagram for all sickness. An inverse association between the two variables is immediately observed. Thus, for example, all ratios less than 0.53 in value are associated with total frequencies greater than 1,300 while, with but two exceptions, all ratios greater than 0.56 have corresponding total frequencies of less than 1,000. It is of interest to observe that the year 1942 accounts for both exceptions.

Identifying symbols for each of the 4 quarters show clearly the contribution of each to the total picture. Noteworthy is the contribution of the first quarter which is an important determining factor in the inverse character of the correlation. With the exception of 1942, all first-quarter ratios are less than 0.57 while the frequency rates range from 1,100 to 1,700. The ratios and rates for the other 3

quarters tend to fall in the lower right-hand quarter of the figure. It will be observed that all but one of the ratios for the fourth quarter lie between 0.55 and 0.64 while the corresponding frequency rates range from 700 to 1,000. The second-quarter ratios vary from 0.53 to 0.64 with 8 of the 10 associated frequencies lying between 600 and 800. The ratios for the third quarter range from 0.57 to 0.68 with 9 of the 10 frequencies falling between 400 and 600.

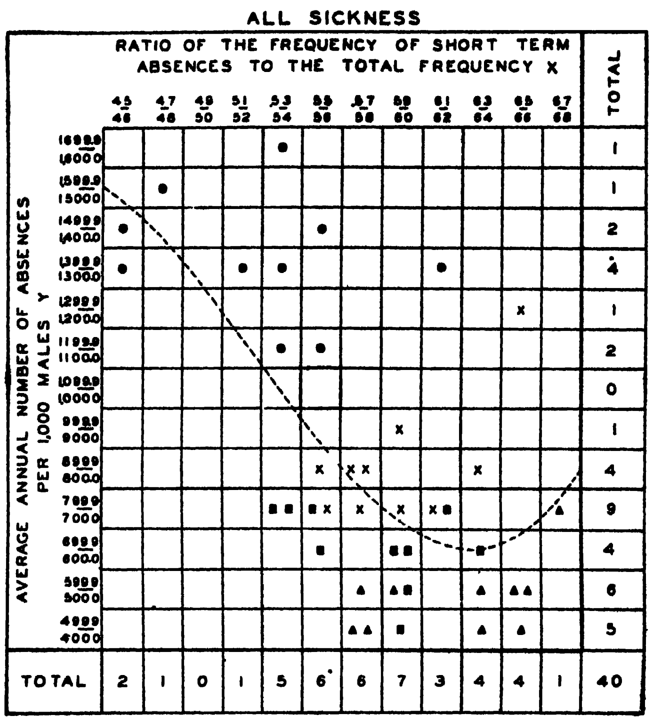

FIGURE 2—Scatter diagram showing the relationship between the proportion of short term absences and the total frequency of absences due to all sickness, experience of male employees in a public utility, 1938–42, inclusive The broken curve may be described by the cubic equation $Y = -22{,}678 + 149{,}754X - 298{,}994X^2 + 190{,}572X^3$

The question arises of describing more precisely the trend of the observations shown in figure 2. Since the frequency-ratio relationship is not linear a curve of higher order was chosen and specifically determined by the method of least squares. The equation of the curve reads $Y = -22{,}678 + 149{,}754X - 298{,}994X^2 + 190{,}572X^3$ where Y is the total frequency and X the ratio. The curve is shown in figure 2 and describes reasonably well the trend of the observations.

Respiratory diseases.—A similar scatter diagram for the respiratory diseases is presented in figure 3. A wider variation in the values of the ratio is clearly evident in the figure, but the inverse association of ratio and rate is retained. All ratios less than 0.53 are associated

with total frequency rates of more than 800 while all ratios larger than 0.56 are, with two exceptions, associated with frequencies of less than 700, the two exceptions, as in the corresponding instance of all sickness, being the first and fourth quarters of 1942.

The contribution of the first quarter is again an important element in the determination of the inverse character of the relationship; the

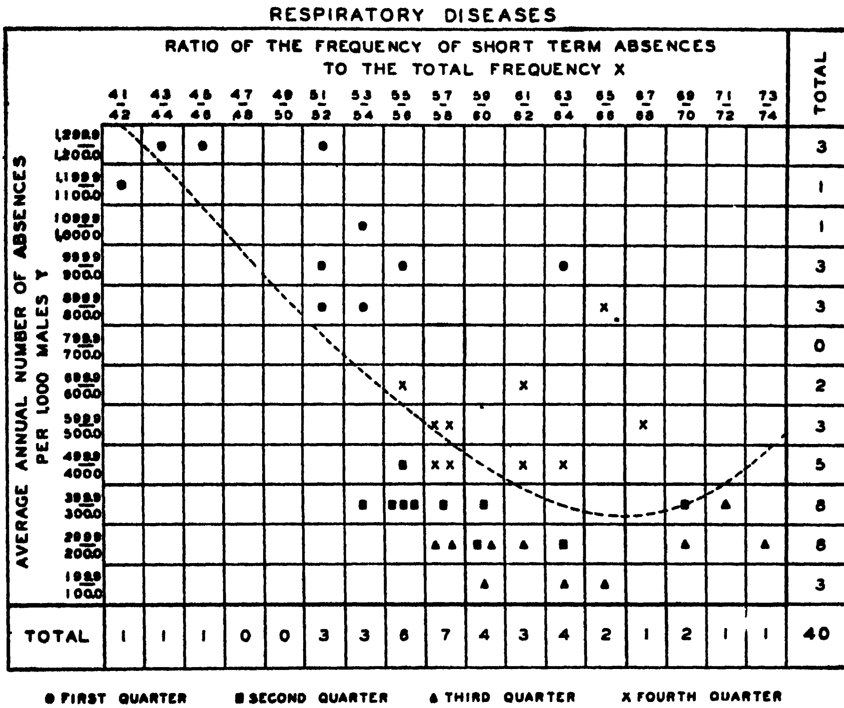

FIGURE 3.—Scatter diagram showing the relationship between the proportion of short term absences and the total frequency of absences due to the respiratory diseases, experience of male employees in a public utility, 1933–42, inclusive. The broken curve may be described by the cubic equation $Y=-836+23{,}071X-61{,}536X^2+44{,}316X^3$

first-quarter rates, all higher than 800, are in general associated with ratios of less than 0.57. Also of importance is the contribution of the third quarter whose ratios range from 0.57 to 0.74, the associated frequencies falling between 100 and 400.

As in the instance of all sickness it is possible to describe the frequency-ratio trend by a cubic curve. The calculated equation of the curve reads $Y=-836+23{,}071X-61{,}536X^2+44{,}316X^3$, and the curve is shown in figure 3.

DISCUSSION

The 10-year experience of the male public utility workers showed generally a relatively low proportion of short absences in the quarter

for which were recorded relatively high frequencies of sickness or respiratory diseases. The mean proportion of short absences for all sickness varied in the 4 quarters from 52 percent in the first quarter to 62 percent in the third, with 58 percent and 60 percent representing the second and fourth quarters, respectively. The corresponding upper and lower limits for the respiratory diseases were 51 and 64 percent, with 58 and 61 percent for the second and fourth quarters, respectively. Thus the elimination of the nonrespiratory diseases effected relatively little change in the proportions for all sickness.

However, the range of the proportions corresponding to the 40 quarter-years increased from 45–68 percent to 41–74 percent when the nonrespiratory diseases were eliminated, the frequency range changing from 400–1,700 to 100–1,300. Thus, while the range of the proportions widened, the frequency range remained almost the same but was translated necessarily to a lower level, the downward movement covering approximately 300 frequency units.

The inverse association of frequency and proportion of short-term absences is of particular interest from the standpoint of seasonal variation. The effect of the winter months on absence frequency is well known; it now appears that the periodic increase in frequency is not evenly distributed among the disabilities of different durations but is less in evidence among the short-term absences. Likewise, the general decrease in frequency during the summer months is accompanied by a relatively smaller decrease in the frequency of the short-term absences.

SUMMARY

The present inquiry, the fifth of a series on the duration of disabling sickness, is concerned with the frequency of short-term absences lasting less than 4 days and its relation to the total frequency.

Based on the 10-year disability experience of a public utility company, it is shown that high total frequencies regularly occurring in the first quarter of each year are associated with relatively small proportions of short-term absences, the proportion tending to become smaller in epidemic periods; on the other hand, the low total frequencies generally appearing in the third quarter of each year are associated with relatively large proportions of such absences. A further investigation of this relationship by means of scatter diagrams for all sickness and the respiratory group of diseases revealed, in general, an inverse association between the magnitude of the total frequency and the proportion of short-term absences. Two cubic equations describing the trend of the relationship are presented for all sickness and the respiratory group of diseases.

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PATHOLOGIC CHANGES IN ANIMALS EXPOSED TO A COMMERCIAL CHLORINATED DIPHENYL [1]

By J. W. MILLER, *Surgeon (R), United States Public Health Service*

The demands of industry as a result of the war have greatly increased the use of chlorinated naphthalenes and chlorinated diphenyls. In the past few years the hazards associated with their application have attracted much interest and a number of reports regarding the systemic and dermatologic effects of exposure, including fatal cases, have been made.

Only the pathologic changes in animals exposed to a commercial chlorinated diphenyl are given here.

The chlorinated diphenyl used was viscous, almost water white, and clear at room temperature. It consisted of a mixture of isomers of diphenyl chlorinated in different positions and extent, with an approximate chlorine content of 42 percent and an approximate empirical formula of $C_{12}H_7Cl_3$. It was insoluble in water but soluble in mineral and vegetable oils, other chlorinated hydrocarbons, and fat solvents. Its specific gravity was 1.374 to 1.393.

Guinea pigs, rats, and rabbits were exposed to the above compound by subcutaneous injections, feeding, and applications to the skin and cornea. The survival times given here refer only to animals subjected to pathologic examination in each exposed group. Certain additional

[1] From the Industrial Hygiene Research Laboratory, National Institute of Health. This material is based on experiments conducted by Surgeon Benjamin F. Jones and Physiologist D. D. Donahue.

results reported are from groups of animals exposed solely to obtain pathologic data.

I. SUBCUTANEOUS INJECTIONS

(A) GUINEA PIGS

A series of 31 guinea pigs was injected subcutaneously with a single dose of 0.05 cc. (69 mg.) of the chlorinated diphenyl. Some of these animals were killed and examined at 2-day intervals up to 38 days after injection. Sections were made of the liver, lungs, spleen, kidneys, adrenals, pancreas, heart, and skin, and were stained with hematoxylin and eosin, eosin-polychrome methylene blue (*1*), and frozen sections with hematoxylin and Sudan IV (*2*).

Skin.—In 2 days the skin lesion at the site of subcutaneous injection consisted of a central, faintly basophilic necrotic mass containing much nuclear debris, many polymorphonuclears, and lymphocytes. Much of the nuclear material was present at the periphery. On the periphery were, first a zone of fibrin, then one of monocytes, leucocytes, lymphocytes, and, externally, a few fibroblasts which extended into the adjacent muscle and subcutaneous tissue. In 4 days a poorly-defined zone of fibroblasts accompanied by numerous capillaries was noted in the periphery. In 6 days the necrotic material had become eosinophilic. There was a central portion of finely granular and fibrinoid material surrounded by a zone of nuclear fragments, and a fairly well defined capsule of connective tissue and fibroblasts which extended into the adjacent fat and muscle. If, however, the injected material had been placed in the superficial portion of the derma, the inner portion of the capsule was partially lined by stratified squamous epithelium extending down from the epidermis. The layers of cells adjacent to the necrotic debris were strongly oxyphil, flattened, and lacked nuclei, thus presenting the appearance of early keratinization. These changes are essentially those of chloracne (*3*, *4*, *5*), though the latter are thought to be due to mechanical occlusion of the ducts resulting in accumulation of secretion within the glands.

Encapsulation progressed from the eighth to the thirty-eighth day. When the lesion was superficial, the epithelium continued to develop until it lined the cyst wall, and the portion adjacent to the necrotic material was cornified. The outer layers of fibrous tissue became increasingly collagenous. The necrotic material remained eosinophilic in most cases and nuclear remains became less abundant. When the lesion was deep, the capsule consisted of adult connective tissue; otherwise the appearance was the same.

Liver.—Eight to 10 days after injection, fat droplets were noted in the liver cells. At early examinations, these were very few in numbers, but after 16 days they were present in moderate or very large

numbers. Small fat droplets were generally scattered throughout the lobule, although in some of the sections they were present only about the portal canals. Central atrophy, usually slight or moderate in degree, occurred in practically all of the animals with hepatic fat, and made its appearance at about the same time as the fat. Congestion of the sinusoids was absent in all but 2 of the animals. At irregular intervals and with no particular regard to interval after injection, a slight to moderate amount of perinuclear, basophilic granulation was noted in the liver cells in sections stained with eosin-methylene blue. Focal necrosis occurred in only 4 of 31 animals. It was found in various portions of the lobules and may not be significant.

Spleen.—The spleen showed no particular lesions.

Kidneys.—The kidneys were essentially normal in most of the series. A slight to moderate congestion of the interstitial capillaries was noted. Fat was present in the cells of the convoluted tubules in only two animals.

The adrenals, heart, lungs, and pancreas showed no noteworthy changes.

In another series of 23 animals receiving larger single doses of 0.1 to 0.5 cc. (138 to 690 mg.), which were killed or died from 2 to 24 days after injection, pathologic changes consistent with those found in the previous series were noted. Fatty degeneration in the liver was more marked, appearing on the second day in animals injected with 0.5 cc. (690 mg.). Approximately the same degree of central atrophy resulted from the injection of 0.5 cc. (690 mg.) as from 0 05 cc (69 mg.); central atrophy was more frequent in animals dying or killed before the tenth day. Changes in the spleen were essentially the same except that lymphoid hyperplasia was more frequent and few to moderate numbers of hemosiderin-bearing cells were seen in 12 of 23 animals. In the kidneys congestion of capillaries was more frequent. Fat was absent. The adrenals showed cortical congestion in most animals, sometimes also medullary. Similar adrenal congestion has been observed with carbon tetrachloride (*6*). However in the latter it often goes on to hemorrhage and necrosis. The lungs in the animals which died during the test showed congestion of the alveolar capillaries and focal extravasation of red blood cells and serum into alveoli in only 4 animals. The changes in the skin were essentially the same as those noted before. However, in contrast with the findings following administration of smaller doses, with larger doses the necrotic material in the derma remained basophilic in reaction. The heart and pancreas were normal.

A third series of 10 guinea pigs received a single 0.5 cc. (345 mg. as chlorinated diphenyl) dose of the chlorinated diphenyl dissolved in an equal amount of mineral oil. These all died within 13 days. The

pathologic picture was essentially the same as noted in the previous series. The lungs showed somewhat greater congestion and edema in 9 of 10 guinea pigs.

(B) RATS

A series of 20 rats received a single dose of 0.05 cc. (69 mg.) of chlorinated diphenyl subcutaneously. Animals were killed at 2 and 7 days and at 10-day intervals thereafter up to 90 days.

Liver.– Fat appeared in liver cells of rats much earlier than in guinea pigs. It was already present 2 days after injection and was fairly constant throughout the remainder of the series. Central atrophy was less marked. There was no greater periportal lymphocytic infiltration than in untreated rats. Irregular basophilic stippling of liver cell cytoplasm was noted, as much in untreated controls as in experimental animals.

Spleen.—Congestion of the cavernous veins was more frequent, while reticuloendotheliosis was only slight and often absent. Pulp myelosis, most about trabeculae, occurred in all but two of the animals and varied from slight to marked, as commonly seen in rats.

The lungs, kidneys, adrenals, and pancreas showed no changes. The lesions in the skin were identical with those noted in the guinea pigs in which the materials had been injected deeply. In all but one of the cases the capsule about the necrotic mass consisted of fibrous tissue and fibroblasts. In one animal killed 60 days after injection, a partial epithelial lining of the cavity was noted.

A second series of 10 rats, receiving a 0.5 cc. (690 mg.) dose, was killed at the same time intervals, the last at 40 days. In these, fatty changes in the liver were more marked. The spleen showed considerable hypertrophy in most cases. The other organs were essentially the same.

Two other groups of 4 rats each were given 10 doses (total of 690 mg.) on alternate days and 27 doses (total of 1,863 mg.) daily of 0.05 cc. (69 mg.), respectively. Half of each group was killed 60 and 90 days after the first injection. In all of the rats receiving 10 such doses peculiar round or oval intracellular bodies were observed in the livers of the animals in both 60- and 90-day groups. However a negligible number were found in only 1 rat injected 27 times.

These bodies varied considerably in size. The smaller were homogeneous and usually oxyphilic. Somewhat larger ones showed a denser periphery and paler center. As size increased the central portion became either granular, reticular, or foamy in appearance and occasionally contained a small faintly eosinophilic body about the size of a nucleolus. With the increase in size the shell became sharply demarcated. It was hyaline and deeply eosinophilic, with a scant basophilic outer margin, and sometimes presented a concentric

lamination. The thickness of this hyaline shell varied. Many of the bodies were often within a single cell. They were generally present in the cells in the central one-third to four-fifths of the lobule. The changes in the other organs were consistent with the findings in the previous groups.

(C) RABBITS

Two rabbits were given 0.5 cc. (690 mg.) and another 1.0 cc. (1,380 mg.) for 10 consecutive days. They died 16, 72, and 14 days after injection. Three more received 10 similar daily doses of 345 and 690 mg. as a 50 percent solution of the material in mineral oil and died in 46, 360, and 42 days. Both groups showed essentially the same pathology.

The liver contained numerous fine fat droplets accompanied by focal necrosis in 2 of the rabbits receiving the undiluted material. No fat or other significant changes were observed in those injected with the 50 percent solution. Occasionally slight centrolobular atrophy of liver cell cords was noted. The pathology of the other organs and of the skin lesions was identical with that encountered in the guinea pig and the rat.

II. SKIN APPLICATION TESTS

(A) GUINEA PIGS

One series of 11 guinea pigs received 11 daily skin applications of about 1/40 of a cc. (34.5 mg.) of the undiluted chlorinated diphenyl These died at various intervals up to 21 days following first application. The pathologic changes in the liver, kidneys, lungs, adrenals, and heart were essentially those noted in the subcutaneous injection series. The spleen showed less pathology. The skin lesions, however, differed from those in the subcutaneous group. In another series of 2 animals receiving 11 (17 mg.) doses with an equal amount of mineral oil, similar changes were noted.

Changes in the skin were not constant in the animals which died in 12 to 21 days after the first of 11 applications of the undiluted material. The principal changes were injection of the capillaries of the derma and occasional thickening of the epidermis. The congestion was sometimes accompanied by edema of the derma adjacent to the small blood vessels. In one instance, a moderate infiltration of lymphocytes occurred.

In a group of 14 animals painted daily with 10, 20, 30, and 50 percent (3.5 to 17 mg.) chlorinated diphenyl in mineral oil, and which died or were killed 7 to 15 days after first application, the primary change was thinning and often destruction of the superficial, cornified layers of the epithelium. When destruction of the epidermis occurred, the superficial cells contained fine, granular material, and in

some eosinophilic inclusions. The amount of involvement of the skin appeared to have no relationship with the dose or length of exposure. The reaction was not that of an acute inflammation.

(B) RATS

Sixteen rats received 25 daily applications of about 1/40 of a cc. (34.5 mg.) of the undiluted chlorinated diphenyl and were killed at 10-day intervals beginning at 30 and ending at 90 days after initial treatment.

Very little fat was found in the liver of 6 of the animals. Three rats showed the hyaline bodies in the liver cells at the 60- and 90-day intervals.

Slight to moderate degree of congestion of the cavernous veins of the spleen was noted. Pulp myelosis was present in a moderate degree. In 7 of the 16 animals, a slight to moderate amount of intracellular hemosiderin was noted.

No significant changes were found in the kidneys, heart, pancreas, and lungs.

In some of the rats the treated skin was much thickened, and the hair follicles were swollen and poorly defined.

(C) RABBITS

Eleven rabbits received cutaneous applications, at 2-day intervals, of about 86 mg. for the first 7 and 172 mg. for the last 8 applications of the undiluted chlorinated diphenyl. The animals were examined as death occurred between 17 and 98 days. The number of applications varied from 9 to 15. Seven of the rabbits received the latter number.

Fatty degeneration and central atrophy of the liver cells were more prominent than in the previous series of experiments.

The spleen showed less pathology and in two of the animals (90 and 98 days) was normal. The changes noted were slight to marked congestion of the cavernous veins and slight to moderate follicular lymphoid hyperplasia. Focal caseous necrosis occurred in four instances, but was probably due to intercurrent infections.

Changes in the heart, lungs, adrenals, and kidneys were slight and consisted primarily in congestion.

The skin showed thinning of the prickle cell layer and relative thickening of the outer cornified layers.

III. FEEDING EXPERIMENTS

(A) GUINEA PIGS

A series of 8 guinea pigs received 2 doses of 0.05 cc. (69 mg.) of the chlorinated diphenyl 1 week apart. Death occurred in 11 to 29 days after initial feeding.

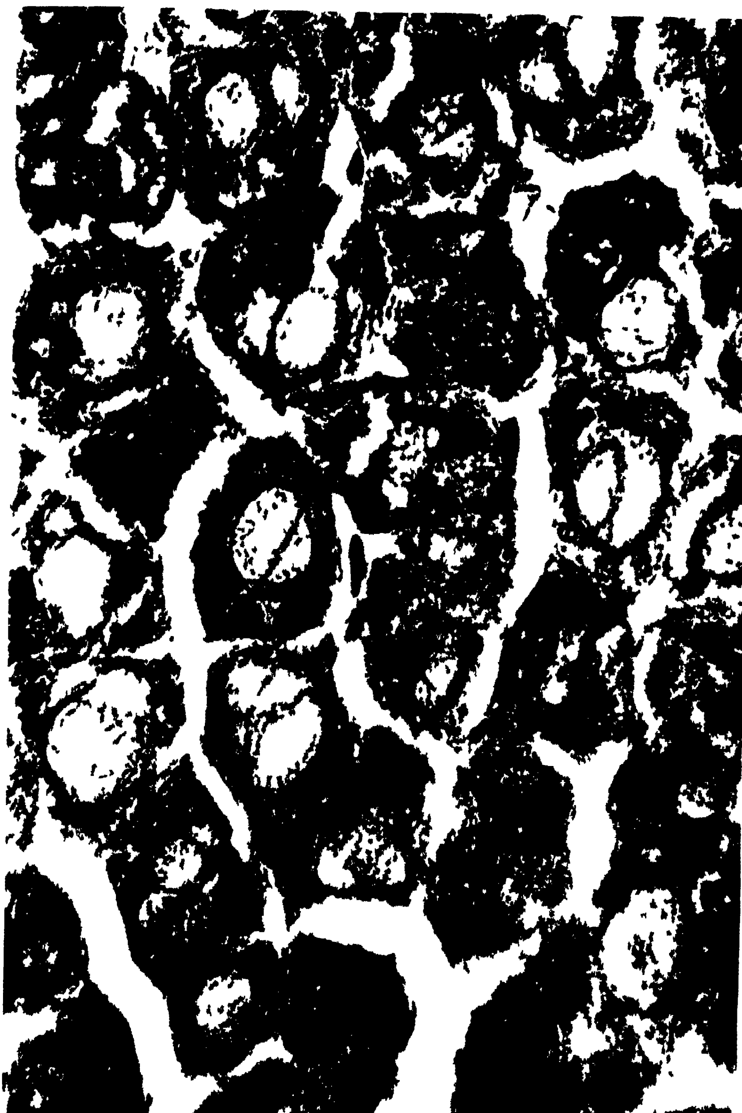

FIGURE 1 Intracellular hyaline bodies in livers of rats exposed to a chlorinated diphenyl

The changes in the liver were more marked in this series than in the others. Fatty metamorphosis was extensive in all of the animals and was of mixed fine, medium, and large droplet variety. Central atrophy was noted in only 2 animals dying 18 and 29 days after the initial feeding.

The changes in the other organs were of the same negligible character and degree as observed in the other experiments. The gastrointestinal tract showed no abnormal histology. No changes were noted in the central nervous system.

(B) RATS

Twelve rats receiving 25 daily doses of 0.1 cc. (138 mg.) were killed and examined at 10-day intervals, beginning at 30 and ending at 90 days after initial feeding.

The pathologic findings were practically identical with those of the series of rats receiving skin applications of 25 daily doses. The intracellular hyaline bodies mentioned previously were found in the livers of 2 of the animals. No changes were noted in the gastrointestinal tract.

IV. APPLICATIONS TO CORNEA

RATS

A small amount (1 drop from a 25-gage hypodermic needle, approximately 1/80 cc. or 17 mg.) of chlorinated diphenyl was instilled into the eyes of 8 rats for 25 consecutive days. Beginning 30 days after the initial dose, 2 of the animals were killed and examined each 10 days.

The pathologic changes were very scant in degree. Slight central atrophy of the liver cords occurred in half of the rats at various irregular intervals. Slight to moderate congestion of cavernous veins of the spleen was constant. The presence of blood pigment, both free and intracellular, occurred rather frequently in the spleen.

The conjunctival tissue presented no gross changes when examined under magnification in the living animal.

SUMMARY AND DISCUSSION

Guinea pigs, rats, and rabbits were exposed to a commercial chlorinated diphenyl by subcutaneous injections and applications to the skin. The material was also administered to guinea pigs and rats by ingestion and to rats alone by corneal instillations. The doses varied from 17 to 1,380 mg. and were either single or were repeated at regular intervals.

Two conspicuous pathologic findings were observed—liver damage in all series of experiments and skin changes in the animals receiving subcutaneous injections or applications of the material to the skin.

Fatty degeneration and atrophy of the centrolobular cells were present in varying amounts and in varying numbers of animals in

the different test groups. In the rat an additional finding, hyaline bodies within the liver cells, was noted in certain animals. It was possible to detect a difference in response of the three species to the material on the basis of liver damage. Most liver damage was found in the guinea pig, less in the rabbit, and least in the rat. This same species order was followed, regardless of dose, duration of test, or mode of administration.

Hepatic fat appeared in the guinea pigs receiving 0.05 cc. subcutaneously in 10 days and remained in significant amounts throughout 38 days. Rats receiving the same amount showed fat in 2 days but only small amounts were noted in some of the animals over a period of 90 days. Fat appeared earlier in both rats and guinea pigs receiving larger doses. The involvement was generally centrolobular.

Fatty degeneration, when compared with the other routes of administration, was most marked in the guinea pigs fed the chlorinated hydrocarbon but was absent in rats similarly treated. Central atrophy was more or less the same throughout the series of tests. Only slight central atrophy was present in about half of the rats treated by application of the material to the cornea.

Intracellular hyaline bodies were found in the liver of the rat alone. They were present, usually in large numbers, in all of the rats receiving 10 0.05-cc. doses and in some of the animals receiving 25 doses by skin and corneal applications and ingestion, but were not observed in any of the animals subjected to single doses. These bodies were noted in the animals sacrificed 50, 60, and 90 days after first exposure. None were observed in rats ex nined prior to 50 days on test. They occurred in from 20 to 38 percent of the animals treated in the various ways. They were somewhat less marked in degree and in number of animals when the chlorinated diphenyl was ingested. These findings agree with Bennett (*7*) who reported similar hyaline bodies in liver cells of white rats exposed to mixtures of chlornaphthalenes and chlorinated diphenyl, chlorinated diphenyl, and less frequently to mixtures of chlornaphthalenes. To date such bodies have only been observed in rats exposed to such chlorinated compounds.

It is interesting to note that while the bodies appeared in all of a series of 4 rats receiving 10 0.05-cc. subcutaneous doses given on alternate days, they were absent in 4 rats treated with the same amount by 27 consecutive daily injections after 60 and 90 days following first exposure. The liver cells in the latter series showed very slight deviation from normal, namely, areas of oxyphil granulation of cytoplasm and occasional loss of nucleus. It is possible that the gradual accumulation of 1,863 mg. over a period of 27 days so damaged the liver cells functionally that they were unable to form the hyaline material. The hyaline bodies are morphologically different from those produced by butter yellow in hepatic tumor cells (*8*).

They probably represent further development of the same general type of hyaline degeneration as has been observed with certain azobenzenes (*9*).

The skin lesions produced by subcutaneous injection were histologically similar to those of chloracne in man. The changes produced by direct application to the skin were not constant and were essentially those of low-grade irritation. The failure of local applications to produce acne lesions may be due to relatively early deaths from systemic toxic action before pathology could be produced in the skin or the amount tolerated without causing death was too small to cause such lesions.

Attention is called to the fact that the chlorinated diphenyl used in the above experiments produces liver changes in the rat having marked differences from those resulting from other toxic substances and that such changes were not found in the guinea pig and rabbit.

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DEATHS DURING WEEK ENDED AUGUST 5, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug 5, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8,125	8,286
Average for 3 prior years	7,801	
Total deaths, first 31 weeks of year	288,008	294,930
Deaths under 1 year of age	654	639
Average for 3 prior years	600	
Deaths under 1 year of age, first 31 weeks of year	19,218	20,927
Data from industrial insurance companies:		
Policies in force	66,691,894	65,698,468
Number of death claims	11,548	10,889
Death claims per 1,000 policies in force, annual rate	9.1	8.6
Death claims per 1,000 policies, first 31 weeks of year, annual rate	10.3	10.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 12, 1944

Summary

The number of reported cases of poliomyelitis increased from 932 for the preceding week to 1,015 for the current week, increased incidence being reported in the Northeastern, Northern, and Western geographic areas, decreases in the South Central States, and the same number being reported for each week in the South Atlantic area. Of 14 States reporting 20 or more cases for the current week, 5 States reported decreases, 8 reported increases, and 1 State, Massachusetts, reported the same number for each week (23 cases): *Increases* (last week's figures in parentheses)—New York 356 (311), New Jersey 21 (16), Ohio 57 (48), Illinois 27 (14), Michigan 53 (40), Minnesota 24 (14), North Carolina 61 (40), Oregon 20 (16); *decreases*—Pennsylvania 72 (86), Indiana 33 (36), Maryland 26 (27), Virginia 35 (63), Kentucky 47 (65). The incidence increased in North Carolina after a decline for 4 successive weeks.

A total of 5,009 cases has been reported to date this year, as compared with 3,311 for the same period last year, 3,729 and 3,942 for the corresponding periods of 1934 and 1931, respectively. For the 7 weeks since June 25, a total of 4,227 cases has been reported, as compared with 2,417 for the same period last year.

The annual case rates of poliomyelitis per 100,000 population for recent years in the United States are as follows: 1934—5.9; 1935—8.4; 1936—3.5; 1937—7.3; 1938—1.3; 1939—5.6; 1940—7.4; 1941—6.9; 1942—3.2; 1943—9.3.

The incidence of meningococcus meningitis continues to decline, although it is still currently nearly 6 times the median expectancy, while the cumulative total to date this year is nearly 10 times the 5-year (1939–43) cumulative median for the period, though slightly below that for last year.

Of a total of 198 cases of endemic typhus fever reported for the current week (131 for the same week last year), Texas reported 81 cases, Alabama 31, and Georgia 28.

The cumulative incidence of typhoid fever to date this year (3,087) has dropped below the figure for last year (3,090), which was the lowest on record.

A total of 8,150 deaths was reported for the week in 93 large cities in the United States as compared with 8,140 last week and a 3-year average of 7,591 for the week. The cumulative figure for these cities to date is 296,173 as compared with 302,958 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 12, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943	
NEW ENGLAND												
Maine	3	1	0	------	------	------	2	28	12	0	0	0
New Hampshire	0	0	0	------	------	------	0	0	1	1	0	0
Vermont	0	0	0	------	------	------	4	19	14	0	2	0
Massachusetts	1	3	3	------	------	------	46	121	83	8	11	2
Rhode Island	0	0	0	------	------	------	0	12	11	0	4	0
Connecticut	1	0	0	------	2	------	9	26	19	4	5	1
MIDDLE ATLANTIC												
New York	6	2	8	[1] 1	([1])	[1] 1	129	310	208	22	21	7
New Jersey	3	1	1	1	3	2	38	153	66	9	12	1
Pennsylvania	7	5	8	------	------	------	34	47	47	12	12	2
EAST NORTH CENTRAL												
Ohio	1	5	3	1	2	4	21	87	32	8	6	1
Indiana	5	7	5	3	------	2	5	23	6	1	9	0
Illinois	4	6	13	4	2	2	18	58	40	8	11	0
Michigan [2]	9	2	2	------	1	1	37	96	88	8	3	1
Wisconsin	1	2	0	14	7	7	144	240	141	3	4	0
WEST NORTH CENTRAL												
Minnesota	4	0	0	1	1	------	12	39	11	1	2	0
Iowa	3	4	2	------	------	------	2	5	21	4	1	0
Missouri	1	1	1	1	------	------	29	16	3	11	5	0
North Dakota	0	0	3	------	------	------	0	23	5	0	0	0
South Dakota	0	2	1	------	------	------	0	9	3	0	0	0
Nebraska	1	2	0	2	2	------	12	3	3	0	0	0
Kansas	2	3	3	------	------	------	6	10	10	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	2	0	1	2	0
Maryland [2]	0	1	2	1	1	------	1	30	6	5	2	1
District of Columbia	0	0	1	1	------	------	6	7	7	1	3	0
Virginia	9	3	9	23	26	37	11	20	20	2	8	1
West Virginia	10	2	4	------	------	2	1	6	5	4	0	0
North Carolina	11	9	10	------	------	------	31	29	29	2	7	1
South Carolina	5	7	7	57	101	110	8	11	6	0	1	1
Georgia	5	7	9	5	24	16	4	10	6	3	2	1
Florida	4	2	2	------	5	4	4	1	4	4	10	0
EAST SOUTH CENTRAL												
Kentucky	3	1	3	1	------	1	13	4	4	2	0	1
Tennessee	5	5	4	9	5	6	2	27	9	3	0	0
Alabama	5	11	11	3	9	16	3	20	8	3	0	2
Mississippi [2]	7	3	3	------	------	------	------	------	------	3	4	1
WEST SOUTH CENTRAL												
Arkansas	4	3	6	12	1	11	4	21	4	0	0	0
Louisiana	3	8	2	5	1	3	4	4	4	0	0	0
Oklahoma	1	1	3	2	2	7	22	10	2	0	4	0
Texas	30	22	21	210	210	151	75	50	50	3	4	2
MOUNTAIN												
Montana	1	2	1	------	------	------	1	36	8	1	0	0
Idaho	0	0	0	------	------	------	6	3	1	0	0	0
Wyoming	4	2	2	------	1	------	2	5	5	1	1	1
Colorado	4	3	4	4	16	9	5	23	8	2	2	0
New Mexico	7	1	0	------	------	------	2	0	4	0	1	0
Arizona	2	3	1	8	40	18	8	16	9	2	1	1
Utah [2]	0	0	0	------	------	------	7	12	12	2	0	0
Nevada	1	0	0	------	------	------	9	13	2	0	0	0
PACIFIC												
Washington	0	10	2	2	------	------	26	21	21	0	3	0
Oregon	2	0	0	3	4	3	45	20	20	2	3	1
California	20	13	10	6	26	17	291	126	113	11	19	2
Total	195	165	165	380	463	451	1,139	1,852	1,539	158	185	33
32 weeks	6,557	7,053	7,456	338,114	81,161	151,299	590,181	535,558	465,780	12,944	13,268	1,392

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended August 12, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943		Aug. 12, 1944	Aug. 14, 1943	
NEW ENGLAND												
Maine	0	0	0	14	2	2	0	0	0	0	0	0
New Hampshire	0	0	0	0	[illegible]	1	0	0	0	0	0	0
Vermont	3	0	1	1	[illegible]	3	0	0	[illegible]	1	0	0
Massachusetts	23	1	1	47	[illegible]	45	0	0	0	8	1	2
Rhode Island	1	8	0	0	0	0	0	0	0	1	0	0
Connecticut	10	27	[illegible]	4	[illegible]	4	0	0	0	0	3	3
MIDDLE ATLANTIC												
New York	356	30	11	[illegible]	48	[illegible]	0	0	0	9	8	16
New Jersey	21	[illegible]		[illegible]	11	18	0	0	0	1	8	6
Pennsylvania	72	3	3	[illegible]	[illegible]	41	0	0	0	3	10	15
EAST NORTH CENTRAL												
Ohio	57	1	9	[illegible]	49	49	0	0	0	2	10	10
Indiana	33	3	7	1	[illegible]	[illegible]	1	1	0	[illegible]	[illegible]	6
Illinois	27	70	[illegible]	[illegible]	33	3	0	2	1	3	4	7
Michigan [3]	3	4	10	39	18	35	1	0	0	4	4	4
Wisconsin	8	1	1	[illegible]	44	31	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	24	[illegible]	[illegible]	14	13	12	0	1	0	2	0	1
Iowa	13	5	3	13	[illegible]	[illegible]	0	0	0	0	5	5
Missouri	9	11	4	4	9	13	0	0	0	4	7	9
North Dakota	2	2	1	0	3	[illegible]	2	0	0	0	0	0
South Dakota	0	0	0	3	10	[illegible]	[illegible]	0	1	2	0	0
Nebraska	4		1	3	3	5	0	0	0	0	0	0
Kansas	9	89	6	[illegible]	15	16	0	0	0	4	0	4
SOUTH ATLANTIC												
Delaware	9	0	0		0	0	0	0	[illegible]	0	0	0
Maryland [2]	26	0	1	[illegible]	10	10	0	0	0	3	[illegible]	3
District of Columbia	10	[illegible]	0	4	5	3	0	0	0	0	1	1
Virginia	35	3	3	19	13	11	0	0	0	4	7	9
West Virginia	15	2	2	21	22	12	0	0	0	10	5	[illegible]
North Carolina	61	3	[illegible]	23	27	21	0	0	0	4	3	8
South Carolina	[illegible]	0	2	1	[illegible]	4	0	0	0	4	1	8
Georgia	5	0	1	12		7	0	0	0	1	12	23
Florida	0	0	2	2	1	2	0	0	0	7	2	5
EAST SOUTH CENTRAL												
Kentucky	17	3	[illegible]	13	11	13	0	0	0	17	11	17
Tennessee	[4] 9	1	3	9	22	12	0	0	0	6	8	11
Alabama	[illegible]	1	2	13	4	8	0	0	0	3	4	12
Mississippi [2]		0	2	3	1	4	0	0	[illegible]	2	11	11
WEST SOUTH CENTRAL												
Arkansas	2	[illegible]	3	3	[illegible]	5	0	0	0	4	7	19
Louisiana	11	7	2	2	2	1	0	0	0	5	10	10
Oklahoma	3	40	2	2	5		0	0	0	6	10	10
Texas	7	67	3	27	22	12	0	1	0	16	17	16
MOUNTAIN												
Montana	1	0	0	3	3	5	0	1	0	0	3	1
Idaho	1	0	[illegible]	4	1	1	0	0	0	0	0	0
Wyoming	0	0	0	0	5	1	0	0	0	0	0	0
Colorado	0	7	1	5	19	8	0	0	[illegible]	0	1	1
New Mexico	0	[illegible]	1	0	1	1	0	1	[illegible]	1	3	2
Arizona	3	9	2	1	8	2	0	0	0	1	5	1
Utah [2]	2	9	1	6	11	2	0	0	0	0	0	1
Nevada	1	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	1	13	3	11	16	8	0	0	0	0	0	0
Oregon	20	13	0	7	8	6	1	0	0	1	5	3
California	11	94	12	60	62	35	0	0	0	3	0	4
Total	1 015	545	278	711	660	593	11	7	7	161	197	355
32 weeks	[illegible]009	3 311	1 706	146 942	96 866	96 866	290	[illegible]07	1 175	3 087	3 090	1 195

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever cases reported separately as follows: Massachusetts 7, Rhode Island 1, New York 2, Michigan 1, Minnesota 1, Georgia 2, Florida 2.
[4] For the month of July, 2 additional cases of poliomyelitis were reported in Tennessee and are included in the cumulative totals.

Telegraphic morbidity reports from State health officers for the week ended August 12, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended—Aug. 12, 1944	Whooping cough: Week ended—Aug. 14, 1943	Whooping cough: Median 1939–43	Week ended August 12, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	18	14	20	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	39	42	14	0	0	0	0	0	0	0	0	0
Massachusetts	57	75	147	0	0	10	0	1	0	1	0	0
Rhode Island	2	14	13	0	0	0	0	0	0	0	0	0
Connecticut	54	30	36	0	0	3	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	178	251	343	3	4	29	0	1	0	2	0	1
New Jersey	68	158	158	0	0	0	0	0	0	0	0	0
Pennsylvania	80	188	230	1	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	257	150	243	0	0	2	0	1	0	1	0	0
Indiana	29	83	50	0	1	0	0	0	0	0	0	0
Illinois	148	190	204	0	3	3	0	2	0	0	0	0
Michigan [2]	106	205	264	0	1	6	0	0	0	0	0	0
Wisconsin	176	236	220	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	12	58	51	0	6	0	0	0	0	0	0	0
Iowa	5	20	42	0	0	0	0	1	0	1	0	0
Missouri	20	99	31	0	0	0	0	1	0	1	2	0
North Dakota	70	29	13	0	0	0	0	1	0	0	0	0
South Dakota	0	5	4	0	0	0	0	0	0	0	0	0
Nebraska	9	22	13	0	0	0	0	0	0	0	0	0
Kansas	42	58	50	0	1	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	4	1	3	0	0	0	0	0	0	0	0	0
Maryland	124	124	71	0	0	0	2	0	0	4	0	1
District of Columbia	1	27	21	0	0	0	0	0	0	0	0	0
Virginia	53	163	81	0	0	0	226	0	0	4	1	0
West Virginia	29	44	4[illegible]	0	0	0	0	0	0	0	0	0
North Carolina	215	136	115	0	0	0	0	0	0	5	0	15
South Carolina	77	71	35	0	0	21	0	0	0	0	1	4
Georgia	12	8	8	0	1	11	0	0	0	4	0	28
Florida	14	27	6	0	3	0	1	0	0	0	0	16
EAST SOUTH CENTRAL												
Kentucky	54	38	43	0	0	1	0	0	0	0	0	0
Tennessee	19	64	54	0	0	0	5	1	0	0	0	0
Alabama	9	26	21	0	2	0	0	0	0	0	0	31
Mississippi [2]				0	0	0	0	0	0	0	0	13
WEST SOUTH CENTRAL												
Arkansas	11	21	14	0	2	45	0	0	0	0	1	0
Louisiana	0	13	1[illegible]	0	4	36	0	0	0	0	0	8
Oklahoma	13	16	16	0	0	0	0	0	0	0	0	0
Texas	245	191	132	0	31	538	0	0	0	0	0	81
MOUNTAIN												
Montana	16	17	17	0	0	0	0	0	0	0	0	0
Idaho	3	0	3	0	0	0	0	0	0	0	0	0
Wyoming	11	1	4	0	0	0	0	0	0	2	0	0
Colorado	17	40	22	0	0	0	0	1	0	0	0	0
New Mexico	2	10	8	0	1	6	3	0	0	0	0	0
Arizona	20	13	11	0	0	0	47	0	0	0	0	0
Utah [2]	62	89	55	0	0	0	0	0	0	0	3	0
Nevada	3	2	2	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	14	80	40	0	0	0	0	0	0	0	0	0
Oregon	2	43	30	0	0	0	0	0	0	0	0	0
California	53	155	155	0	2	13	0	1	0	0	0	0
Total	2 483	3 347	3 302	4	62	724	284	12	0	25	8	198
Same week, 1943	3 347			1	41	428	416	22	0	32	15	131
Same week, 1942	3 039			1	30	392	278	19	0	24	24	164
32 weeks, 1944	61 317			30	1,062	13 448	4 869	362	18	348	375	2,499
32 weeks, 1943	128 864			40	1 310	9 682	4 298	398	18	330	579	2,054
32 weeks, 1942	119 319		[5] 128 864	56	682	5 320	4 027	299	34	[5] 353	637	[5] 1,409

[2] Period ended earlier than Saturday.

[5] 5-year median, 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 29, 1944

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Case	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	1	0	0	0	1	0	3	0	0	1
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	6	0	0	0
Massachusetts:												
Boston	2	0	------	0	39	2	10	2	7	0	1	10
Fall River	0	0	------	0	0	0	2	0	0	0	0	10
Springfield	0	0	------	0	4	2	0	2	1	0	0	8
Worcester	0	0	------	0	0	0	0	0	1	0	0	4
Rhode Island:												
Providence	0	0	------	0	11	1	0	0	1	0	0	6
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	1	0	0	0	8
Hartford	0	0	------	0	1	1	0	0	3	0	0	0
New Haven	0	0	------	0	1	0	0	0	1	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	1	4	0	6	47	5	0	0	0
New York	7	1	2	0	14	14	39	50	27	0	5	54
Rochester	0	0	------	0	18	0	1	4	0	0	0	6
Syracuse	0	0	------	0	0	0	2	5	1	0	0	16
New Jersey:												
Camden	0	0	------	0	0	0	0	0	0	0	0	0
Newark	0	0	------	0	9	1	0	0	4	0	0	7
Trenton	0	0	------	0	0	0	1	0	0	0	0	0
Pennsylvania:												
Philadelphia	1	0	------	0	12	4	7	11	15	0	0	14
Pittsburgh	0	0	------	0	1	1	7	23	8	0	0	3
Reading	0	0	------	0	1	0	0	0	0	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	0	0	1	5	10	0	0	8
Cleveland	0	0	------	0	1	3	3	8	7	0	2	30
Columbus	0	0	------	0	0	0	0	2	4	0	0	25
Indiana:												
Fort Wayne	0	0	------	0	0	0	0	3	2	0	0	4
Indianapolis	0	0	------	0	0	3	2	0	2	0	0	2
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	1	0	0	0
Illinois:												
Chicago	2	0	2	0	17	9	10	5	11	0	0	35
Springfield	0	0	------	0	0	0	0	0	0	0	0	0
Michigan:												
Detroit	7	0	------	0	20	2	8	21	12	0	1	58
Flint	0	0	------	0	0	0	2	0	0	0	0	0
Grand Rapids	0	0	------	0	1	0	0	0	0	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	0	0	0	22
Milwaukee	0	0	------	0	21	0	2	1	6	0	0	34
Racine	0	0	------	0	19	0	1	0	1	0	0	7
Superior	0	0	------	0	3	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	10	[illegible]	1	0	4	0	0	0
Minneapolis	0	0	------	0	1	1	5	2	13	0	1	0
St. Paul	0	0	------	0	4	1	2	6	0	0	0	16
Missouri:												
Kansas City	1	0	------	0	2	0	2	0	5	0	0	0
St. Joseph	0	0	------	0	0	0	0	0	1	0	0	0
St. Louis	0	2	------	0	1	3	5	0	3	0	1	7
Nebraska:												
Omaha	1	0	------	0	0	1	0	0	0	0	0	0
Kansas:												
Topeka	0	0	------	0	3	0	0	0	2	0	0	3
Wichita	0	0	------	0	0	0	2	1	1	0	0	4

City reports for week ended July 29, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	1	0	0	0	0	0
Maryland:												
Baltimore	0	0	------	0	2	3	4	6	9	0	0	84
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	6	3	10	4	5	0	0	0
Virginia:												
Lynchburg	0	0	------	0	0	0	0	4	0	0	0	0
Richmond	0	0	------	0	0	0	2	0	2	0	0	0
Roanoke	0	0	------	0	0	0	0	9	1	0	0	8
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	0	0	0	0
Wheeling	0	0	------	0	3	0	2	0	1	0	0	4
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	0	0	0	7
Wilmington	0	0	------	0	3	0	1	1	0	0	0	15
Winston-Salem	0	0	------	0	0	0	1	0	1	0	0	5
South Carolina:												
Charleston	0	0	------	0	0	1	0	0	0	0	0	1
Georgia:												
Atlanta	0	0	5	1	2	1	4	1	2	0	0	1
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	2	1	0	0	0	0
Florida:												
Tampa	1	0	1	0	1	0	5	0	1	0	0	3
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	0	4	0	0	0	2	11
Nashville	0	0	------	0	1	0	3	1	0	0	0	1
Alabama:												
Birmingham	0	0	------	0	0	0	3	0	0	0	0	2
Mobile	0	0	------	0	0	1	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	0	0	0	0	1	0	0	4
Louisiana:												
New Orleans	0	0	------	0	0	0	4	0	0	0	0	0
Shreveport	0	0	------	0	0	0	3	0	1	0	2	0
Texas:												
Dallas	0	0	------	0	3	0	1	0	1	0	0	4
Galveston	0	0	------	0	0	0	0	0	1	0	0	0
Houston	5	0	------	0	0	0	3	0	2	0	1	4
San Antonio	0	0	1	0	1	0	7	0	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	0	0	0	0	0	2
Great Falls	0	0	------	0	0	0	0	0	0	0	1	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	1	1	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	2	0	------	0	4	0	3	0	4	0	0	20
Pueblo	0	0	------	0	0	0	0	0	2	0	0	0
Utah:												
Salt Lake City	0	0	------	0	11	0	1	0	2	0	0	14
PACIFIC												
Washington:												
Seattle	1	0	------	0	6	0	4	0	2	0	0	3
Spokane	0	0	------	0	5	0	1	0	0	0	0	1
Tacoma	5	0	------	0	2	0	2	0	3	0	0	1

City reports for week ended July 29, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC—continued												
California:												
Los Angeles	7	0	1	0	65	5	0	2	11	0	0	11
Sacramento	0	0		0	4	0	3	0	4	0	0	4
San Francisco	1	0	1	1	41	1	4	0	10	0	0	6
Total	41	3	15	3	380	61	200	229	232	0	17	624
Corresponding week, 1943	24		24	7	838		262		179	0	36	1,273
Average, 1939-43	44		28	[1] 5	[2] 739		245		230	1	40	1,299

[1] 3-year average, 1941-43

[2] 5-year median

Dysentery, amebic.—Cases: Detroit, 2, St Louis, 1, Los Angeles, 2, San Francisco, 1

Dysentery, bacillary.—Cases: New Haven, 1, New York, 4, Chicago, 1, Detroit, 5, Charleston, S. C., 21, Nashville, 1, Los Angeles, 9

Dysentery, unspecified.—Cases: Pittsburgh, 1, Richmond, 5, Shreveport, 1

Rocky Mountain spotted fever.—Cases: New York, 1, Nashville, 1.

Tularemia.—Cases: Duluth, 1, St Louis, 1

Typhus fever, endemic.—Cases: Charleston, S. C., 1, Atlanta, 3, Brunswick, 1, Savannah, 4; Tampa, 7, Birmingham, 7, Mobile, 8, Shreveport, 2, Houston, 4, San Antonio, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,357,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.3	0.0	2.6	0.0	147	15.8	34.1	13.1	45	0.0	2.6	129
Middle Atlantic	4.2	0.5	0.9	0.5	27	9.3	29.2	64.8	28	0.0	2.3	47
East North Central	5.5	0.0	1.2	0.0	50	10.3	17.6	27.4	35	0.0	1.8	137
West North Central	4.0	4.0	0.0	0.0	42	12.1	34.2	18.1	58	0.0	4.0	60
South Atlantic	1.6	0.0	9.8	1.6	28	13.1	52.3	42.5	38	0.0	0.0	209
East South Central	0.0	0.0	0.0	0.0	6	5.9	59.0	5.9	0	0.0	11.8	83
West South Central	14.3	0.0	5.7	0.0	11	0.0	51.7	0.0	17	0.0	8.6	37
Mountain	15.9	0.0	0.0	0.0	127	0.0	31.8	7.9	71	0.0	7.9	286
Pacific	22.1	0.0	3.2	1.6	195	9.5	22.1	3.2	47	0.0	0.0	41
Total	6.7	0.5	2.3	0.5	58	9.7	30.4	34.8	35	0.0	2.6	95

TERRITORIES AND POSSESSIONS

Panama Cana Zone

Notifiable diseases—June 1944.—During the month of June 1944, certain notifiable diseases were reported in the Panama Canal Zone, including terminal cities, as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	5		1		12				18	
Diphtheria	7						2		9	
Dysentery (amebic)	1	2		1			4		5	3
Dysentery (bacillary)	3	2	2						5	2
Malaria [1]	26	2	4		141		66	6	237	8
Measles					8				8	
Mumps			2		2		2		6	
Paratyphoid fever					1		2		3	
Pneumonia		7		6	22	1		1	[2] 22	15
Relapsing fever							1		1	
Tuberculosis		24		5	3	1		8	[2] 3	38
Typhoid fever		1								1

[1] 41 recurrent cases.

[2] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 15, 1944—During the week ended July 15, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		25		26	202	27	8	75	46	409
Diphtheria	2		1	49	1	5	1			59
Dysentery (bacillary)				3					8	11
Encephalitis infectious						1				1
German measles		2		11	30	2	5	8	15	73
Influenza					9				2	11
Measles		3		240	135	43	32	37	13	503
Meningitis meningococcus				1	4					5
Mumps				49	65	10	14	26	12	176
Poliomyelitis			1		8			5		14
Scarlet fever		6		24	59	24	15	54	22	209
Tuberculosis (all forms)		2		76	52	13	61	21	32	257
Typhoid and paratyphoid fever				8	4					12
Whooping cough		16		23	26	6	7	16	13	107

CUBA

Habana—Communicable diseases—4 weeks ended July 22, 1944—During the 4 weeks ended July 22, 1944, certain communicable diseases were reported in Habana, Cuba, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	25	1	Measles	7	
Leprosy	1		Tuberculosis	7	2
Malaria	2		Typhoid fever	44	2

NEW ZEALAND

Notifiable diseases—4 weeks ended July 15, 1944—During the 4 weeks ended July 15, 1944, certain notifiable diseases were reported in New Zealand as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Ophthalmia neonatorum	3	
Cerebrospinal meningitis	14	1	Puerperal fever	1	
Diphtheria	92	3	Scarlet fever	863	2
Dysentery (amebic)	3		Tetanus	2	1
Dysentery (bacillary)	17	1	Trachoma	3	
Erysipelas	36		Tuberculosis (all forms)	183	34
Food poisoning	1		Typhoid fever	5	1
Malaria	57		Undulant fever	3	

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Smallpox

French Equatorial Africa.—For the month of May 1944, 180 cases of smallpox with 45 deaths were reported in French Equatorial Africa.

India—Calcutta.—Smallpox has been reported in Calcutta, India, as follows: Weeks ended July 15, 1944, 108 cases, 88 deaths; July 22, 1944, 93 cases, 85 deaths.

Typhus Fever

Algeria.—For the period July 1–10, 1944, 26 cases of typhus fever were reported in Algeria.

Chile.—For the period May 21 to June 17, 1944, 46 cases of typhus fever with 1 death were reported in Chile. Provinces reporting the highest incidence of the disease are as follows: Antofagasta, 10 cases; Santiago, 18 cases, 1 death; Valparaiso, 7 cases. According to telegraphic information dated July 27, 1944, there has been an epidemic of typhus fever in the Island of Tac, Chiloe Province, Chile, with 62 cases and 11 deaths reported.

Egypt.—For the week ended July 8, 1944, 284 cases of typhus fever with 66 deaths were reported in all of Egypt.

Hungary.—For the 2 weeks ended July 15, 1944, 159 cases of typhus fever (77 cases in Subcarpathia) were reported in Hungary.

Irish Free State—Galway County—Oughterard.—For the week ended July 22, 1944, 1 case of typhus fever was reported in Oughterard, Galway County, Irish Free State.

Rumania.—For the week ended April 7, 1944, 120 cases of typhus fever were reported in Rumania.

Spain.—Typhus fever has been reported in Spain as follows: weeks ended—May 27, 1944, 11 cases; June 3, 1944, 7 cases.

Yellow Fever

Brazil—Para State.—Yellow fever has been reported in Para State, Brazil, as follows: May 13, 1944, 1 death in Braganza; May 19, 1944, 1 death in Igarape-Miri.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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METHODS OF SANITIZING EATING AND DRINKING UTENSILS [1]

By JOHN ANDREWS, *Sanitary Engineer (R), United States Public Health Service*

Although the knowledge of many factors influencing the efficiency of dishwashing is still incomplete, the present knowledge, if properly applied, is sufficient to bring about a great improvement in its general effectiveness and give a larger measure of protection. The question of disease transmission by eating and drinking utensils is discussed in some detail in the Ordinance and Code Regulating Eating and Drinking Establishments recommended by the Public Health Service (Public Health Bulletin No. 280)

Many persons who have observed conditions in public restaurants will agree that there is need for improvement in dishwashing methods in many communities. The results of some actual bacteriological studies support these observations Recently a comprehensive survey of the conditions of eating and drinking establishments was made in an eastern city (*1*). Bacterial counts were made of plates, tumblers, spoons, forks, and beer glasses at establishments of different types. The lowest count reported, 2,800, was on spoons at 8 soda fountains. The highest count, 7,000,000, was on beer glasses at 19 barrooms. The next to the highest count, 390,000, was on tumblers at the 8 soda fountains. Each figure is the average "swab count" of 10 utensils. Rabbit blood agar was used for plating. These counts, all of which are greatly in excess of the standard of 100 organisms per utensil surface, show the need for improvement in dishwashing practice in that city.

Recently, mobile laboratory units of the United States Public Health Service have assisted State and local health departments in making swab tests of restaurant utensils in several communities located in different sections of the country. Unpublished reports of this work show clearly that there is need of improvement in dishwashing in most, if not all, of the communities visited.

[1] From the Milk and Food Section, Sanitary Engineering Division.

Studies by Mallmann (*2*) illustrate the improvement which can be made in dishwashing practice by application of present knowledge. Bacterial counts of utensils were made at several restaurants before and after an educational program on dishwashing. In almost all cases the counts were reduced from several thousand to less than 100. In the same article Mallmann gives an interesting tabulation of counts obtained on individual utensils at a large restaurant using a dishwashing machine and operating it properly. These data show an average count of 17 organisms per utensil surface.

Tests have shown that the standard of less than 100 organisms per utensil surface can be maintained by hand dishwashing methods (*3*). Mallmann reports tests in which an average utensil count of 67 was obtained by hand methods over a period of 2 years, as compared with an average of 36 for another series of tests on dishes washed by machine.

The above data and other observations seem to indicate that, on the average, lower bacterial counts are obtained with machine washing than with hand methods. However, the data do not justify the conclusion that manual methods should universally be discarded in favor of dishwashing machines. Satisfactory results can be obtained by either method, and the choice of methods should be made by the restaurant.

The purpose of this paper is to present the existing recommended methods of dishwashing.

DETERGENTS

A good detergent (*4*, *5*) should have the following properties:

1. Wetting: the ability to wet readily the utensil being cleaned.
2. Emulsification: the ability to emulsify the fats from the food soil on the utensils.
3. Dissolving: the ability to dissolve food materials, principally proteins.
4. Deflocculation: the ability to break up dirt particles.
5. Dispersion: the detergent should function properly in hard or soft waters, and preferably should be of a type which will minimize the formation of a film or deposit of mineral salts and similar substances on the utensils and equipment. This property of film-prevention is called dispersion because the products of the chemical reaction between the detergent and the hardness constituents of the water are kept dispersed in the solution and their precipitation, with consequent formation of film, is minimized.
6. Rinsing: the property of being easily rinsed off the utensil by clean water.

No single chemical substance possesses all of these properties to the desired degree; many detergents used for dishwashing are mixtures. For example, one proprietary compound is said to have approximately the following composition (dehydrated basis): 6 percent sodium hydroxide, 18 percent trisodium phosphate, 28 percent sodium metasilicate, and 48 percent sodium hexametaphosphate. Following is a

brief tabulation of the properties of several detergent ingredients (*5, 6, 7, 8, 9*):

1. Sodium hydroxide (lye) is a good dissolving agent but lacks the other properties, and is extremely dangerous to the skin and eyes. In general, the alkalis are ineffective detergents by themselves.
2. Soap is a good simple detergent when used in soft water, although it has no dispersion property and, obviously, its properties of emulsification and deflocculation are limited. The reaction between soap and the hardness constituents of water results in insoluble soap, which leaves a deposit on the utensils and equipment.
3. Sodium carbonate (soda ash) has the properties of the alkalis and is useful as a water softener. The products of the reaction precipitate and form films.
4. Trisodium phosphate has satisfactory emulsifying and deflocculating properties, but its wetting and dispersion properties are insufficient to make it a completely effective detergent for dishwashing. However, it is useful as a water softener.
5. Sodium metasilicate has detergent properties which are similar to those of trisodium phosphate, but it is less corrosive to certain metals.
6. Sodium hexametaphosphate is an effective water-softening agent and has excellent dispersion properties. It forms soluble compounds with the calcium and magnesium hardness-constituents of water, dissolves "lime soaps," and thus acts to prevent the formation of film on utensils and of scale and sludge on sinks and in dishwashing machines. Otherwise, this substance has little detergent property.
7. Tetrasodium pyrophosphate and sodium tetraphosphate have detergent properties similar to those of sodium hexametaphosphate.
8. Various "wetting agents" (sulfated alcohols, for example) have been used by the textile industry as penetrants to improve the penetration of dyes. Recently, these agents, also called "synthetic detergents," which have definite emulsification and deflocculation properties, have been used in dishwashing detergents. The calcium and magnesium salts of sulfated alcohols are soluble; thus objectionable films and precipitates are avoided.

While "wetting agents," or "synthetic detergents," have caused great changes in the detergent field, their utility for certain purposes is limited. Their ability to cause foam or suds is great, and if the washing solution is pumped, as in most dishwashing machines, only a small amount of a wetting agent can be used in the detergent mixture; otherwise a thick blanket of foam will interfere with operation.

9. Other ingredients are often used in detergent compounds. For example, buffering and other substances are used to decrease the violence of the alkaline reaction and to minimize corrosion of metal sinks and dishwashing macnines. Inert abrasives are sometimes used but are generally undesirable in dishwashing detergents.

The selection of detergents on a scientific basis is quite complex, and as yet no satisfactory method of evaluating them in simple terms has been devised. Although it is relatively easy to evaluate detergent compounds or ingredients in terms of the six essential properties, the difficulty arises in attempting to combine these indiyidual properties into an over-all efficiency rating. Of course, restaurants may evaluate detergents roughly by observing their apparent effectiveness in actual dishwashing operations, but a scientific, standard technique for such evaluation is needed. The New York State Department of Health and the New York State Agricultural Experiment Station are working on such a test (*5, 10*), and the results are awaited with interest.

The following factors influence the selection and efficiency of detergents: Hardness of the water, equipment to be used, temperature, time of contact, and concentration. A concentration of about 0.3 percent is, in general, the most satisfactory, but the optimum concentration varies with different detergents. It is important that the proper concentration be maintained in the wash water. Among the methods proposed for testing the concentration are: Alkalinity, pH, and electrical conductivity. Other indices are the presence or absence of foam, and the intensity of color caused by a dye mixed with the detergent. None of these methods is entirely satisfactory, and reliance is usually placed upon approximate methods of maintaining the detergent concentration.

HAND DISHWASHING METHODS

The facilities required include a 2- or 3-compartment sink of sufficient size with adequate drainboards, provision for convenient scraping of dishes and disposal of the scrapings, a prerinsing arrangement, baskets for utensils, adequate hot-water heating facilities, a suitable detergent, an intelligent dishwasher, and capable supervision. The illustration on page 26 of the 1943 edition of the Ordinance and Code Regulating Eating and Drinking Establishments shows satisfactory washing facilities.

The dishes should be scraped well to remove gross food particles, preferably should be prerinsed, and sorted. The wash water should contain a sufficient quantity of a suitable detergent and should be heated to 110° to 120° F., which is about as hot as the hands can stand. An ample amount of "elbow grease" must be used. The washed utensils should then be stacked in a basket and placed in the second compartment of the sink.

As washing continues, the water temperature drops, the water becomes laden with bacteria, food particles, grease, etc., and the soap or other detergent becomes weaker. The dishwasher must, therefore, add detergent from time to time, keep the water hot, and change the water before it becomes too dirty. Scraping and prerinsing of utensils help to keep the wash water clean and reduce the consumption of detergent.

The restaurant ordinance and code recommended by the Public Health Service requires that the dishes be given bactericidal treatment after washing. This may be done by immersion in hot water or a chlorine solution, or by other methods. Glasses and cups should be immersed in such a position as to prevent the formation of air pockets, which will prevent the hot water or chlorine solution from reaching all surfaces of the utensils. Glasses and cups may be placed on their sides or some other method may be used to insure that they will not trap air.

If hot water is used, the baskets of washed dishes are submerged in

hot water (at least 170° F.) in the second compartment of the sink for at least 2 minutes. The baskets must, of course, have long handles extending well above the water level in the sink. Both rinsing and bactericidal treatment are accomplished in the second compartment of the sink by this method, which constitutes compliance with the minimum requirements of the code. It is recommended, however, that a 3-compartment sink be used, so that the utensils may be rinsed in warm water in the second compartment before being placed in the hot water in the last compartment.

It is important that the water temperature in the "sterilizing" compartment be maintained above 170° F. This may be done by suitable water heating facilities, as, for example, by thermostatically controlled heating elements in the bottom of the vat. An interesting device developed some time ago in Lenoir, N. C., consists of an insulated sink provided with a metal cover and a thermometer, which is connected by 1" piping to a "side-arm" type of water heater using gas or kerosene. The burner is kept on throughout the dishwashing operation, and the water, which circulates through the 1" pipes to the sink and back to the heater, is kept above 170° F. by adjusting the burner according to the thermometer reading. Information is not available as to whether or not this device has been patented.

If chlorine is used for bactericidal treatment, a 3-compartment sink is mandatory, with the exception of installations already existing when the ordinance is adopted locally. In this event, the second or rinsing section may be omitted if a satisfactory rinsing or spraying device is substituted. An effective rinse after washing and before immersion in a chlorine solution is necessary because chlorine is depleted rapidly by organic matter and detergent carried over from the wash vat. Immersion for at least 2 minutes is required if the minimum strength of the chlorine is equivalent to that of 50 p. p. m. of available chlorine when hypochlorites are used. The chlorine solution should be made up at a strength of 100 p. p. m. or more.

After bactericidal treatment, the utensils should be allowed to drain and dry, and should be stored inverted in a clean, dry place. If properly washed dishes are stored in a wet or moist condition, the few remaining bacteria may live and multiply. Where treatment is by hot water, the residual heat promotes quick air drying. If chlorine is used, the utensils may be rinsed in clean running water if desired in order to remove the chlorine odor. Although it is not recommended that utensils be dried with a towel, this is not prohibited by the code. In some hard-water sections toweling is necessary to prevent water spots. The important point is to avoid the use of dirty towels; it has been shown that such towels may add many bacteria to utensils (*3*).

Reports of recent work and experience with alkyl-dimethyl-benzyl-ammonium chlorides indicate that this compound may have much to

recommend it as a chemical bactericidal agent for use in a manner similar to chlorine. It is said to be much easier to maintain the strength of this substance in the rinse water, and it does not have any objectionable taste or odor in the concentrations used.

The use of ultraviolet lamps for the disinfection of eating and drinking utensils has not been accepted widely by health authorities. The Council on Physical Therapy of the American Medical Association has stated that available evidence does not warrant acceptance of ultraviolet lamps for disinfecting solids. According to the Council, the entire subject is too new, too complex, and apparently too uncertain where virulent germs, such as the typhoid organism, may be involved in spreading epidemics (*11*).

MACHINE DISHWASHING METHODS

The manner in which the two objectives of dishwashing—cleaning and removal of harmful bacteria—may be accomplished by machines can be discussed more clearly after a brief consideration of the mechanical features of several types of machines. Figures 1 to 7 present

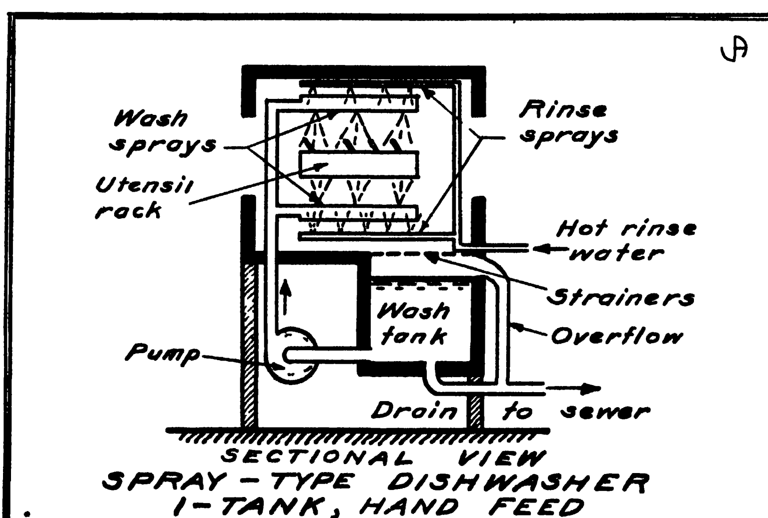

FIGURE 1.

sectional views of several machines. These sketches are not detailed scale drawings and do not show all the parts of the machines. Wash, rinse, and outlet valves, heating elements, and other parts have been omitted in order that the basic principles of operation might be shown more clearly.

Figure 1 is a single-tank, intermittent-operation, spray-type dishwasher. Such machines are frequently used in smaller establishments. The water in the wash tank is heated to the proper temperature by a built-in electric, steam, or gas heater. The detergent is added directly

to the wash tank at the start of operations, and is replenished during the operation by any one of several methods. A single rack of utensils is placed in the machine in the position shown, the sliding doors are closed, and the pump is started. Wash water is discharged onto the utensils from the wash sprays located above and below the utensil rack. The spent wash water flows back into the wash tank through removable strainers or scrap trays, which retain the larger food particles and reduce clogging of the spray nozzles. At the end of the wash period, the wash water sprays are turned off and clean hot water direct from the building hot-water system is sprayed onto the utensils from sprays located above and below the utensil rack. After rinsing, the rack of utensils is removed and another may be placed in the machine.

Figure 2 is a single-tank machine of similar construction but has the wash sprays and the rinse sprays at separate locations, so that racks of utensils may be passed continuously through the machine.

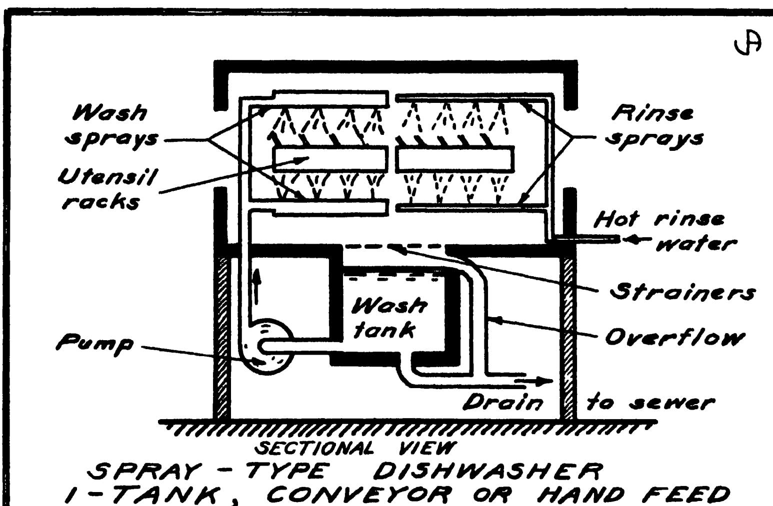

FIGURE 2.

With both of these types of machines, operating difficulties may result because the hot rinse water flows back into the wash tank. This may raise the temperature of the wash water sufficiently to cause the food solids to become "cooked" onto the utensils. For most effective removal of soil, the wash water temperature should be in the range of 120°–140° F. The top limit varies somewhat, because different foods tend to "cook" onto the utensils at different temperatures. However, it is believed desirable to maintain the wash water at as high a temperature as possible, but not over 140° F. The inflow of rinse water also dilutes the detergent and may cause excessively rapid wasting, especially if additional dilution is provided by leaky valves or connections. Rapid dilution of the detergent may be com-

pensated, of course, by the addition of more detergent. The prospective purchaser should give consideration to the probable detergent consumption before deciding which machine to buy.

Figure 3 is a machine quite similar to that in figure 2 but has a

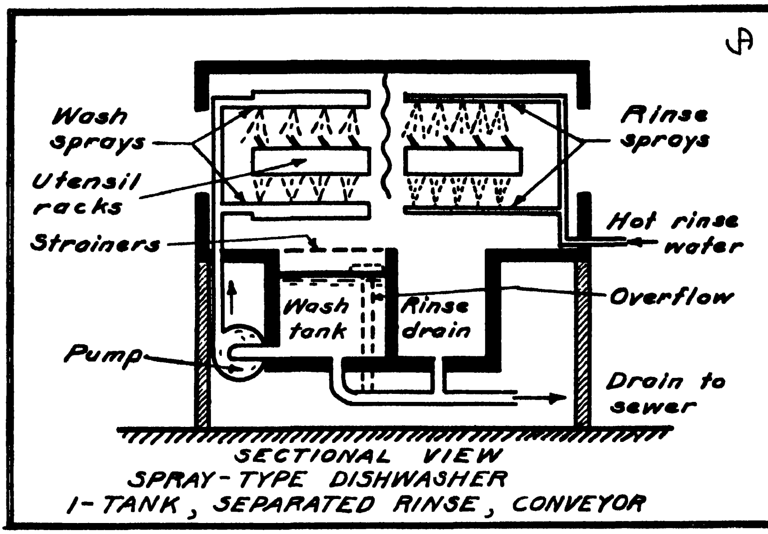

FIGURE 3.

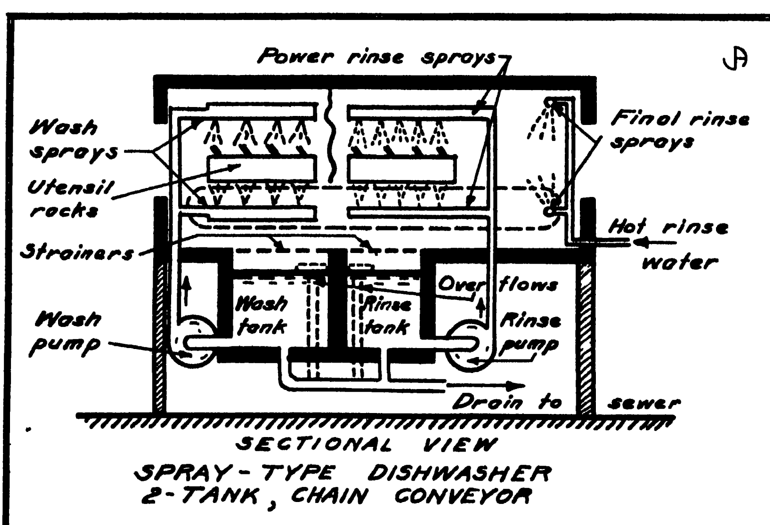

FIGURE 4.

separate means of collecting the rinse water, thus avoiding the excessive heating and dilution mentioned above.

Figure 4 is a 2-tank spray machine having a recirculated rinse before the final fresh-water rinse. This machine should be more economical in its use of hot water from the building system, because the length of

the final rinse can be considerably shorter than in the first three machines.

Figure 5 is one type of glasswashing machine. Glasses are inverted in specially designed wire racks and set in position on the movable carriage over the wash tank. When the operating lever is depressed, the rack of glasses is submerged in the wash water, and revolving brushes scrub the inside and outside surfaces. Additional brushes clean the bottoms. After washing, the carriage is rolled to a position over the rinse tank, and the lever is depressed again. This submerges the glasses in the rinse water in such a position that the recirculated rinse water issuing from the nozzles first reaches the inside surfaces of the glasses. The water in the rinse tank is kept clean by a steady inflow of clean, hot water. After rinsing, the glasses are dried by the fan.

Figure 6 is an immersion-type dishwasher having a motor-driven mechanism which moves a rack of dirty dishes back and forth in the

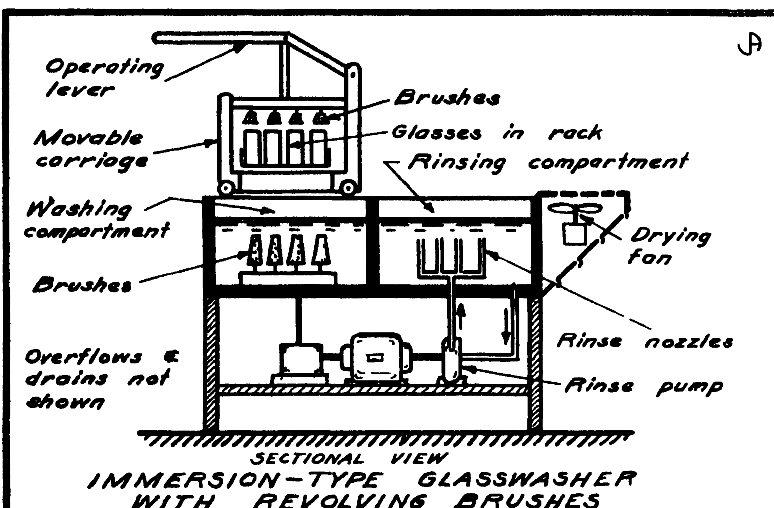

FIGURE 5.

wash water. Following washing, the utensils are given bactericidal treatment in the second compartment of the sink.

Figure 7 is a paddle-type dishwasher which has no pump, sprays, or jets. The wash water is driven onto the utensils by small paddle wheels. This particular model has a separated rinse collection system and in this respect is similar to figure 3.

There are a number of other types of glasswashers and dishwashers. Some of the larger dishwashing machines have more than 2 tanks, and may include 2 washes and 1 recirculated rinse, for example. Recently prerinsing devices have been developed to provide better removal of soil from the dishes before they are placed in the regular dishwashing machine. Glass washers commonly include brushes. It is the gen-

eral opinion that brushing is necessary in order to clean glasses properly.

Several features of dishwasher design are suggested although not specifically required by the Public Health Service restaurant code. The pumps and the sprays or jets should be of such design that a forceful stream of water will reach all surfaces of all utensils when they

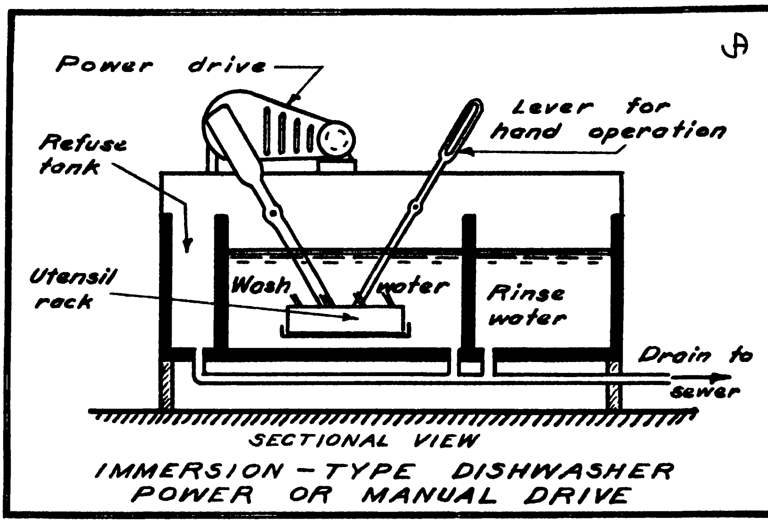

FIGURE 6

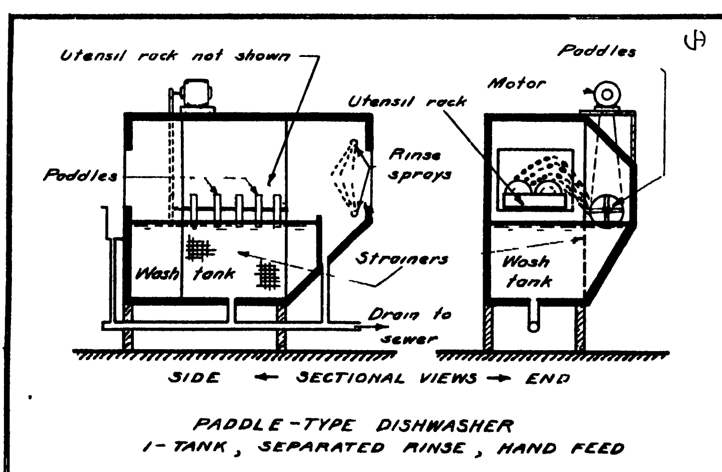

FIGURE 7.

are properly racked. Sprays or jets should be easily accessible and readily removable for cleaning. The temperature of the wash and rinse waters should be thermostatically controlled, and thermometers should be provided on the wash and rinse lines in such a location as to be readily visible. Properly operating automatic detergent dispensers are also recommended.

ADDITIONAL FACTORS INFLUENCING EFFICIENCY OF MACHINES

1. Length of washing period. Obviously, long washing periods are more effective than short ones, since detergent action, like other chemical reactions, requires time for completion. Acceptable results may be obtained with wash periods of at least 40 seconds to 1 minute.

2. Temperature and duration of rinse. Acceptable results may be achieved with water at 170° F. or higher, and with a rinse of at least 15 to 30 seconds. It is assumed that such a rinse will have been preceded by an adequate wash.

These wash and rinse periods and temperatures are not mandatory in the recommended restaurant code, because it is felt that the knowledge of the many factors influencing the process is not yet complete enough to warrant making such specifications a part of the legal requirements. Consequently, the temperatures and times given should be used as guides rather than as rigid specifications, in order to furnish some definite recommendations to restaurateurs. For purposes of very rough comparisons, dishwashing machine exposures may be compared with high-temperature short-time pasteurization of milk, in which milk-borne pathogens are inactivated by heating the milk to 160° F. and holding at that temperature for at least 15 seconds. Such a comparison is misleading, however, unless it is clearly recognized that exposure of dishes and other utensils to a stream of hot water at 160° F. for 15 seconds will not cause their surfaces to be at this temperature for the full 15 seconds. Actually, some time is required to raise the temperature of the utensil; consequently a more intense heat treatment must be used for dishes than for milk.

3. The "rush hour" problem. It has been observed frequently that the person operating a dishwashing machine may follow the recommended procedure when he has time, but that during rush hours he will rush the dishes through the machine too rapidly to give proper washing and rinsing. For example, observations at one large cafeteria during the noon rush showed that for a group of 10 consecutive racks of dishes washed, 1 rack was in the machine for only 20 seconds, 4 for 30 seconds, 3 for 45 seconds, and 2 for 60 seconds (*10*). Obviously the shorter exposures are inadequate. One solution of this serious problem is to encourage the restaurant to have in use a large enough supply of utensils to tide over the rush period without having to make the dishwashing operation only a pretense. In the future, it would be desirable to design all dishwashing machines so that utensils cannot be rushed through faster than the predetermined, proper rate.

4. Rate of dilution of wash water. As has already been pointed out, the wash water in single-tank machines is diluted considerably by the hot rinse water. Some such dilution is desirable in order to keep the wash water fairly clean, to flush floating material into the overflow, and to restrict the increase of the bacteria count of the

wash water. With improper operation the count of the wash water may increase to such a point that more organisms are added to the utensils during washing than are removed. Excessive dilution is objectionable, however, and this can be reduced in some machines (such as the type shown in fig. 2) by installing a catchpan connected to the overflow which will discharge most of the rinse water to the sewer. The rate of dilution of the wash water is largely determined by the design of the machine.

5. Method of adding the detergent. Continuous addition at a rate controlled automatically by the strength of detergent in the wash water is the ideal method. The simplest method is to make an initial charge of detergent when the wash tank is first filled, and to add charges at regular intervals during the operation. For example, one detergent manufacturer recommends, for water of 5-grain hardness or less, an initial charge of 1 ounce of detergent for each 5 gallons of wash tank capacity. For single-tank machines, one-third the initial charge is added after each 20 minutes of operation, while with multiple-tank machines, these additions are made after each hour of operating time.

Several types of automatic detergent dispensers are made. In some types, the detergent powder or cake is placed in a small cylindrical container and small quantities are dissolved periodically by wash or rinse water flowing over the container or by water from a bleeder line from the rinse system. In other types, the detergent is dissolved in water in a container on top of the dishwashing machine and the flow of the solution into the wash tank is controlled by a simple petcock or an adjustable regulating cup.

6. Method of racking utensils. The utensils must be placed in the racks without overcrowding, in order that the wash and rinse waters may reach all surfaces of every utensil. Dishes, saucers, etc., should not be nested or overlapped but should lean back slightly so that the surfaces touched by food will receive the spray from above. Utensils of different sizes should not be mixed, and cups and glasses should be inverted so they will drain. Cups should never be placed on top of a rack of saucers or plates.

7. Clogging of sprays or nozzles. Food particles will accumulate and eventually clog wash sprays or nozzles unless they are cleaned frequently. Daily removal for cleaning may sometimes be required, and it is essential that a regular schedule for cleaning be established. Rinse sprays may also become clogged, and they should be checked and cleaned frequently. The strainers or refuse trays above the wash tank should be kept clean, and the whole interior of the machine should be left clean at the end of each dishwashing period. At this time the machine should be emptied and the interior scrubbed, hosed,

or flushed with clean, hot water. The used wash and rinse waters should not be allowed to stand in the tanks and cool off, as grease and food solids will then adhere to the cmahine.

8. Adequacy of the supply of hot water. The temperature of the recirculated wash and rinse waters may be maintained by the integral heating devices in the tanks, but the building hot-water system must be able to supply a sufficient quantity of water at 170° F. for the final rinse. Since relatively few general hot-water supply systems for buildings can comply with these requirements, booster heaters usually must be provided. The design of such systems merits special attention by the firm making the installation. Frequently it is found that an adequate supply of hot water is available at the start of the dishwashing operation, but that the temperature drops a great deal before the operation is finished. In one instance it was found that the water line from the heater to the machine was so long and contained so much cooling surface that only water which had been cooling in the pipe line for some time actually reached the rinse sprays (*10*). The water temperature, as a result, was inadequate.

9. Defects of some dishwashing machines. Studies (*10*) indicate that there is room for improvement in the design of dishwashing machines. These include design changes which would make it easier to clean the tanks, pumps, and piping; improved valve design and location; better protection against back-siphonage; and prevention of backflow from sewers or wastelines into the wash or rinse tanks.

Dishwashing machines have been discussed in some detail because an understanding of their principles is essential to proper operation. It should be repeated, however, that the knowledge of many factors that affect their sanitary efficiency is still incomplete, and that the recommended restaurant code does not yet include detailed specifications covering their design and operation. In lieu of such specifications, the code requires that the bacterial count of the finished utensils shall not exceed 100 organisms per utensil surface examined, where bacteriological laboratory facilities are available.

OPERATION, SUPERVISION, AND TESTS

Frequently the person doing the dishwashing has not been instructed in the proper dishwashing technique, and has not been impressed with the importance of his job. Good equipment or machinery is worthless if it is improperly operated. This is also true of dishwashing machines. Proper training and the creation of job pride will partially solve this problem. The dishwasher should be made to feel that his job is important.

Vigilant inspection is necessary to determine if utensils have been properly cleaned. To emphasize to the restaurant personnel that unclean utensils have been found, some restaurant sanitarians dust

powdered charcoal onto the utensils. The black dust adheres to the soiled spots. Others use a viewing device to inspect drinking glasses. A glass is placed in the device so that its rim is illuminated by a flash-light bulb, and the rim is viewed through a magnifying glass. This makes it easier to see grease spots, fingerprints, or traces of lipstick.

A bacteriological test to determine the sterility of utensils which have gone through the dishwashing process is widely used. This involves counting the total number of bacteria removed from utensils by sterile, moist cotton swabs. If a large number of organisms are found, it is likely that dishwashing has been done poorly and that harmful bacteria, if originally present, may have survived. If only a few organisms are present, it is probable that dishwashing has been done properly and that pathogens are absent. The method is not perfect, because it does not distinguish between harmful and harmless organisms, but it is practical and of great value. Experience has shown that utensils yielding standard swab counts of more than 100 bacteria may be considered improperly washed. Health departments may reasonably require that properly cleaned utensils shall not exceed this average count.

Another test, which is still in the experimental stage (*12*), establishes the presence of a suitable index organism—a bacterium always present in the human mouth and which does not survive proper dishwashing operations.

CONCLUSION

Although many health departments and restaurants have done excellent work, definite improvement in restaurant sanitation has been needed in many American communities for a number of years. Since the outbreak of war, the problem of maintaining good sanitation in restaurants has been intensified by shortages of manpower and materials, increased customer loads, and reductions of health department personnel. There are indications that the amount of disease spread in restaurants is increasing (*13*, *14*). To cope with this situation, health departments must redouble their efforts and increase the efficiency of their programs.

Close, intelligent, and continual cooperation between health authorities and the owners, managers, and employees of restaurants is essential to a successful program. Experience shows that health authorities will achieve the most permanent results by education rather than policing. Restaurant personnel, like all other people, are much more likely to use approved methods if the inspector explains the reasons rather than cites the penalties. Properly organized training courses for restaurant employees probably will do more than any other one measure to promote cooperation and adoption of approved methods. Since dishwashing is an important part of restaurant sanitation, the training course should include adequate treat-

ment of the subject. It is hoped that this paper and the references given may prove useful as a technical guide in the preparation of such courses.

The restaurant sanitation program recommended by the Public Health Service (*15*) offers much of value to health officers who desire to improve their programs or who have hesitated to institute such programs because of uncertainty that the importance justifies the cost Since restaurant sanitation is an important public health activity to which wartime conditions have given a new urgency, the Public Health Service has expanded its activities and services in this field

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DEATHS DURING WEEK ENDED AUGUST 12, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug 12 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8 150	8,028
Average for 3 prior years	7,591	
Total deaths, first 32 weeks of year	296,173	302 958
Deaths under 1 year of age	591	630
Average for 3 prior years	569	
Deaths under 1 year of age, first 32 weeks of year	19,809	21,558
Data from industrial insurance companies		
Policies in force	66 695 383	65 727 142
Number of death claims	12 456	10 596
Death claims per 1 000 policies in force annual rate	9 8	8 4
Death claims per 1,000 policies, first 32 weeks of year, annual rate	10 3	10 1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 19, 1944

Summary

A larger numerical increase was reported in the incidence of poliomyelitis during the current week than in any other week this year. A total of 1,260 cases was reported, as compared with 1,015 for the preceding week and 932 for the next earlier week. The total to date is 6,259 cases, as compared with 4,058 for the same period last year.

Cases were reported during the week in all but five States—Rhode Island, South Dakota, Idaho, New Mexico, and Nevada; but cases have been reported during the year in all States. The following States reported 20 or more cases during the current week (last week's figures in parentheses): New York 469 (356), Pennsylvania 108 (72), Ohio 92 (57), Virginia 66 (35), Michigan 55 (53), North Carolina 48 (61), Minnesota 38 (24), Kentucky 35 (47), Illinois 34 (27), Massachusetts 30 (23), Maryland 30 (26), New Jersey 24 (21), Indiana 23 (33). States reporting the largest numbers of cases to date are New York (1,729), North Carolina (573), Pennsylvania (464), and Kentucky (459).

The peak week of incidence of poliomyelitis last year was the week ended September 18, and for 1942, the week ended September 12.

Only one case of smallpox (in Georgia) was reported during the week. The cumulative incidence of both smallpox and typhoid fever is below that for last year, in which year the lowest figures on record for each of these diseases were reported.

Of 230 cases of endemic typhus fever reported during the week, 73 occurred in Texas, 43 in Georgia, 34 in Alabama, 26 in Florida, and 25 in North Carolina. To date a total of 2,729 cases has been reported, as compared with 2,202 for the same period last year.

A total of 8,657 deaths was reported during the week in 93 large cities, as compared with 8,223 last week and a 3-year (1941–43) average of 7,494. The recent increase in these mortality figures is probably due, at least in part, to the prevailing high temperatures.

Telegraphic morbidity reports from State health officers for the week ended August 19, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Aug. 19, 1944	Aug. 21, 1943		Aug. 19, 1944	Aug. 21, 1943		Aug. 19, 1944	Aug. 21, 1943		Aug. 19, 1944	Aug. 21, 1943	
NEW ENGLAND												
Maine	0	0	0	---	---	---	24	8	15	0	3	0
New Hampshire	0	0	0	---	---	---	7	3	0	3	1	0
Vermont	0	0	0	---	---	---	0	25	12	0	0	0
Massachusetts	1	0	2	---	---	---	43	55	65	8	6	1
Rhode Island	0	0	0	---	---	---	1	12	11	1	1	0
Connecticut	0	0	0	---	---	---	3	15	15	1	1	0
MIDDLE ATLANTIC												
New York	5	8	8	[1] 2	[1] 2	[1] 6	67	258	134	23	32	7
New Jersey	1	1	2	---	1	2	23	74	45	7	3	1
Pennsylvania	3	7	6	3	---	---	17	35	35	15	6	3
EAST NORTH CENTRAL												
Ohio	7	6	3	6	2	2	9	69	16	7	6	0
Indiana	2	12	6	3	3	3	2	9	7	2	1	0
Illinois	6	13	13	1	4	2	16	49	27	9	10	1
Michigan [2]	6	4	4	1	---	1	15	251	39	4	9	1
Wisconsin	2	2	0	20	10	11	136	203	101	6	3	0
WEST NORTH CENTRAL												
Minnesota	9	4	1	---	1	1	2	24	8	2	0	0
Iowa	0	1	2	---	---	---	2	2	15	0	3	2
Missouri	1	0	2	1	1	---	19	7	7	4	2	0
North Dakota	0	4	0	---	4	4	0	8	7	0	1	0
South Dakota	0	0	0	---	---	---	0	4	2	0	1	0
Nebraska	2	3	1	1	3	---	20	4	2	0	0	0
Kansas	1	2	2	---	---	---	3	9	9	1	5	0
SOUTH ATLANTIC												
Delaware	0	1	0	---	---	---	0	1	0	0	2	0
Maryland [2]	5	2	2	---	1	1	3	17	9	3	11	3
District of Columbia	0	0	0	---	---	---	4	6	6	0	2	1
Virginia	5	2	6	24	58	43	13	43	33	3	8	1
West Virginia	2	5	5	4	1	7	4	6	4	2	1	0
North Carolina	8	17	13	1	2	---	8	9	5	1	3	1
South Carolina	7	14	9	102	118	118	5	2	3	0	1	0
Georgia	11	13	12	2	10	8	1	9	5	1	3	0
Florida	5	1	1	4	5	1	4	3	2	6	4	1
EAST SOUTH CENTRAL												
Kentucky	3	2	4	---	1	1	2	11	11	2	0	1
Tennessee	2	5	5	2	2	9	12	7	5	2	2	1
Alabama	13	10	9	11	17	11	3	8	8	5	3	0
Mississippi [2]	9	5	8	---	---	---	---	---	---	1	1	1
WEST SOUTH CENTRAL												
Arkansas	10	4	4	13	5	4	12	2	2	0	1	0
Louisiana	4	10	8	4	8	5	1	22	4	0	2	1
Oklahoma	4	3	3	---	17	11	2	2	2	0	1	0
Texas	39	23	23	292	175	122	44	43	43	7	2	2
MOUNTAIN												
Montana	2	1	1	1	---	1	0	21	10	1	1	0
Idaho	0	0	0	---	---	---	0	17	3	0	0	0
Wyoming	0	1	1	---	2	---	1	9	5	1	0	0
Colorado	2	3	3	25	11	9	4	13	8	1	1	1
New Mexico	1	1	1	1	---	---	0	0	2	0	0	0
Arizona	2	1	1	30	22	9	15	12	3	0	2	0
Utah [2]	0	0	0	---	---	---	23	10	10	0	0	0
Nevada	0	1	0	---	---	---	0	0	0	0	0	0
PACIFIC												
Washington	3	3	1	---	---	---	19	14	20	2	3	0
Oregon	1	8	0	1	---	3	18	12	11	3	2	1
California	19	9	9	9	20	15	170	110	81	11	10	1
Total	203	212	185	564	506	433	777	1,533	1,028	145	160	34
33 weeks	6,760	7,265	7,613	338,678	81,667	151,560	590,958	537,131	466,584	13,089	13,528	1,417

[1] New York City only. [2] Period ended earlier than Saturday.

***Telegraphic morbidity reports from State health officers for the week ended August 19, 1944, and comparison with corresponding week of 1943 and 5-year median*—Con.**

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Aug 19 1944	Aug 21 1943		Aug 19 1944	Aug 21 1943		Aug 19 1944	Aug 21 1943		Aug 19, 1944	Aug 21 1943	
NEW ENGLAND												
Maine	1	0	0	2	2	2	0	0	0	3	0	0
New Hampshire	6	0	0	0	2	2	0	0	0	0	0	0
Vermont	2	0	0	0	2	1	0	0	0	0	1	0
Massachusetts	30	7	6	46	66	40	0	0	0	3	11	6
Rhode Island	0	8	2	1	2	1	0	0	0	1	0	0
Connecticut	15	47	3	2	6	5	0	0	0	2	1	1
MIDDLE ATLANTIC												
New York	469	42	39	58	66	50	0	0	0	16	7	11
New Jersey	24	0	12	11	11	18	0	0	0	3	6	8
Pennsylvania	108	4	5	38	26	40	0	0	0	4	6	14
EAST NORTH CENTRAL												
Ohio	92	14	14	44	63	34	0	0	0	8	5	10
Indiana	23	1	5	15	8	13	0	0	0	1	2	6
Illinois	34	117	18	26	35	43	0	1	1	4	3	6
Michigan[2]	55	11	16	25	32	32	0	0	1	4	10	8
Wisconsin	11	1	1	53	30	30	0	0	0	0	2	0
WEST NORTH CENTRAL												
Minnesota	38	14	14	11	12	16	0	0	0	0	0	0
Iowa	12	8	7	5	10	10	0	0	1	2	1	1
Missouri	4	14	8	6	7	8	0	0	1	1	5	10
North Dakota	4	1	0	3	4	2	0	0	0	0	0	0
South Dakota	0	0	0	0	6	5	0	0	0	0	0	0
Nebraska	2	5	2	1	2	2	0	0	0	0	0	0
Kansas	7	76	3	6	20	20	0	0	0	6	5	3
SOUTH ATLANTIC												
Delaware	6	0	2	0	2	0	0	0	0	0	0	1
Maryland[2]	30	0	0	15	8	8	0	0	0	1	1	4
District of Columbia	19	0	0	4	4	5	0	0	0	0	1	1
Virginia	66	4	4	13	12	9	0	0	0	3	10	9
West Virginia	12	1	1	25	21	18	0	0	0		7	11
North Carolina	48	1	7	28	27	21	0	0	0		1	11
South Carolina	1	1	1	6	8	5	0	0	0	7	8	11
Georgia	5	0	1	3	14	9	1	0	0	11	10	21
Florida	8	0	2	2	2	0	0	0	0	6	4	1
EAST SOUTH CENTRAL												
Kentucky	35	22	15	2	6	14	0	0	0	7	22	22
Tennessee	5	2	3	9	8	15	0	0	0	5	9	13
Alabama	7	2	2	8	7	12	0	0	0	3	5	5
Mississippi[2]	6	3	1	8	10	4	0	0	0	6	6	7
WEST SOUTH CENTRAL												
Arkansas	2	8	4	5	6	6	0	0	0	5	8	13
Louisiana	4	6	3	3	5	5	0	0	0	1	8	15
Oklahoma	6	38	2	0	5	5	0	1	0	2	3	9
Texas	4	52	8	22	11	17	0	0	0	41	13	32
MOUNTAIN												
Montana	2	0	0	7	4	4	0	0	0	0	1	0
Idaho	0	1	0	5	182	1	0	0	0	0	0	0
Wyoming	2	0	0	2	1	0	0	0	0	0	0	0
Colorado	3	20	0	7	11	10	0	0	0	2	0	2
New Mexico	0	1	1	0	0	2	0	0	0	0	2	2
Arizona	3	5	0	8	3	1	0	0	0	1	1	2
Utah[2]	2	16	1	11	10	3	0	0	0	2	0	0
Nevada	0	0	0	1	0	0	0	0	0	0	0	0
PACIFIC												
Washington	12	20	4	16	18	8	0	0	0	0	1	3
Oregon	19	11	3	17	14	5	0	0	0	0	2	2
California	16	163	23	70	52	47	0	0	0	2	8	8
Total	1 260	747	391	650	863	641	1	2	6	170	196	338
33 weeks	6 269	4 058	2,139	147,592	97 729	97 729	300	609	1 187	3 257	3 286	4 533

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Maine, 2, Massachusetts, 2, Connecticut, 1, New York, 2, Michigan, 1, South Carolina, 1, Georgia, 2, Florida, 2, and Texas, 2

Telegraphic morbidity reports from State health officers for the week ended August 19, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Aug. 19, 1944	Whooping cough: Week ended— Aug. 21, 1943	Whooping cough: Median 1939-43	Week ended Aug. 19, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	4	14	27	0	0	0	0	0	0	0	0	1
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	32	12	21	0	0	0	0	0	0	0	0	0
Massachusetts	63	50	139	0	0	1	0	0	0	0	0	0
Rhode Island	6	17	13	0	0	0	0	0	0	0	0	0
Connecticut	37	23	32	0	0	2	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	168	241	298	0	3	35	0	0	0	1	0	0
New Jersey	37	132	132	0	0	0	0	0	0	0	0	0
Pennsylvania	56	226	267	0	0	1	0	0	0	2	0	0
EAST NORTH CENTRAL												
Ohio	152	158	158	0	2	0	0	0	0	0	0	1
Indiana	6	32	32	0	1	0	0	0	0	1	0	0
Illinois	94	194	194	0	2	1	0	2	0	0	0	0
Michigan [3]	78	252	252	0	0	14	0	0	0	0	0	0
Wisconsin	179	312	214	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	44	76	50	0	5	1	0	0	0	0	0	0
Iowa	5	27	26	0	0	0	0	2	0	0	0	0
Missouri	15	33	17	0	0	0	0	0	0	0	0	0
North Dakota	9	13	13	0	0	0	0	0	0	0	0	0
South Dakota	4	38	5	0	0	0	0	0	0	0	0	0
Nebraska	19	6	6	0	0	0	0	0	0	0	0	0
Kansas	24	47	47	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	5	5	0	0	0	0	0	0	0	0	0
Maryland [3]	56	80	57	0	0	0	2	0	0	3	0	0
District of Columbia	7	17	17	0	0	0	0	0	0	0	0	0
Virginia	40	61	50	0	0	0	243	0	0	4	1	1
West Virginia	34	27	27	0	0	0	0	0	0	1	0	0
North Carolina	107	143	92	0	0	0	0	0	0	1	0	25
South Carolina	89	90	53	0	0	1	0	0	0	0	1	4
Georgia	2	9	13	0	0	4	0	0	0	0	0	43
Florida	2	33	16	0	2	0	0	1	0	0	0	26
EAST SOUTH CENTRAL												
Kentucky	60	25	44	0	0	0	0	0	0	1	0	0
Tennessee	20	58	55	0	0	0	8	0	0	0	0	5
Alabama	14	50	22	0	0	0	0	0	0	1	0	34
Mississippi [3]	-------	-------	-------	0	0	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	22	23	11	0	1	57	0	0	0	0	0	0
Louisiana	9	4	8	0	0	3	0	0	2	0	0	15
Oklahoma	17	2	4	0	0	0	0	0	0	2	0	0
Texas	165	166	126	0	32	410	27	1	0	0	1	73
MOUNTAIN												
Montana	9	31	22	0	0	0	0	1	0	0	0	0
Idaho	4	0	2	0	0	0	0	0	0	0	0	0
Wyoming	0	0	3	0	0	0	0	0	0	0	0	0
Colorado	21	40	25	0	0	1	0	0	0	0	0	0
New Mexico	0	6	14	0	0	6	2	0	0	0	0	0
Arizona	9	11	11	0	0	0	33	0	0	0	0	0
Utah [3]	30	45	48	0	0	0	0	1	0	0	1	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	11	42	42	0	0	0	0	0	0	0	0	0
Oregon	8	55	22	0	0	0	0	0	0	0	0	0
California	66	125	170	0	1	9	0	2	0	0	0	1
Total	1,835	3,052	3,063	0	49	546	315	10	2	17	4	230
Same week 1943	3,052			1	41	573	328	30	0	18	11	148
Same week 1942	3,063			1	35	274	288	22	1	8	13	149
33 weeks 1944	63,152			30	1,111	13,994	5,184	372	20	365	379	2,729
33 weeks 1943	131,916			41	1,351	10,255	4,626	428	18	348	590	2,202
33 weeks 1942	122,382		[4] 126,631	57	717	5,594	4,315	321	35	[4] 378	650	[4] 1,819

[3] Period ended earlier than Saturday.

[4] 5-year median 1939-43.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 5, 1944

This table lists the reports from 86 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
NEW ENGLAND												
Maine:												
Portland	0	0		0	1	0	2	0	3	0	1	0
New Hampshire:												
Concord	0	0		0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0		1	25	6	7	2	17	0	2	15
Fall River	0	0		0	0	0	2	0	0	0	0	0
Springfield	0	0		0	5	1	2	0	0	0	0	2
Worcester	0	0		0	0	0	5	0	1	0	1	1
Rhode Island:												
Providence	0	0		0	0	0	1	0	0	0	1	1
Connecticut:												
New Haven	0	0		0	0	0	0	0	0	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	1	0	8	64	2	0	0	0
New York	5	1		0	24	12	41	67	18	0	4	63
Rochester	0	0		0	11	1	3	4	0	0	0	13
Syracuse	0	0		0	1	0	1	4	0	0	0	1
New Jersey:												
Camden	0	0		0	0	0	0	0	1	0	0	0
Newark	0	0		0	4	1	2	0	0	0	0	9
Trenton	0	0		0	0	0	1	0	1	0	0	0
Pennsylvania:												
Philadelphia	1	0		0	2	1	13	15	13	0	1	12
Pittsburgh	0	0	3	3	0	3	6	15	5	0	0	4
Reading	1	0		0	1	0	0	0	0	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0		0	0	1	1	4	8	0	0	6
Cleveland	1	0		1	1	3	3	23	9	0	0	17
Columbus	0	0		0	0	0	1	1	1	0	0	11
Indiana:												
Fort Wayne	0	0		0	0	0	1	1	0	0	0	0
Indianapolis	7	0		0	1	3	5	5	2	0	0	6
South Bend	0	0		0	0	0	0	0	0	0	0	0
Terre Haute	0	0		0	0	0	2	0	0	0	0	2
Illinois:												
Chicago	1	0		0	10	1	16	8	14	0	2	51
Springfield	0	0		0	0	0	1	0	0	0	0	0
Michigan:												
Detroit	4	0		0	4	3	5	24	17	0	3	51
Flint	0	0		0	0	0	1	2	1	0	0	0
Wisconsin:												
Kenosha	0	0		0	1	0	0	0	0	0	0	37
Milwaukee	0	0		0	7	0	1	0	4	0	0	35
Racine	0	0		0	12	0	0	0	0	0	0	16
Superior	0	0		0	4	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	3	0	0	0	6	0	0	2
Minneapolis	0	0		0	3	1	2	3	1	0	0	2
St. Paul	1	0		0	0	2	3	9	0	0	0	8
Missouri:												
Kansas City	0	0		1	0	0	4	1	2	0	0	0
St. Joseph	0	0		0	2	0	0	0	1	0	0	0
St. Louis	0	0		0	14	5	4	2	2	0	0	13

City reports for week ended August 5, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	--	0	0	0	2	0	0	0	0	0
Nebraska:												
Omaha	1	0		0	2	0	2	4	0	0	0	0
Kansas:												
Topeka	0	0	-	0	1	0	2	0	1	0	0	2
Wichita	0	0	--	0	2	0	2	0	0	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	0	2	1	0	0	1
Maryland:												
Baltimore	3	0	1	0	2	0	13	12	3	0	0	92
Cumberland	0	0	-	0	0	0	0	0	0	0	0	0
Frederick	0	0	-	0	0	0	1	0	0	0	0	0
District of Columbia:												
Washington	0	1		0	7	1	4	9	4	0	0	0
Virginia:												
Lynchburg	2	0		0	0	0	0	15	2	0	0	1
Richmond	0	0		0	0	1	0	0	1	0	0	2
Roanoke	0	0		0	0	0	2	2	0	0	0	0
West Virginia:												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	0	0	0	0	0	0
Wilmington	0	0		0	0	0	1	0	0	0	0	10
Winston-Salem	0	0		0	0	0	0	0	1	0	0	2
South Carolina:												
Charleston	0	0	-	0	0	0	1	0	2	0	0	0
Georgia:												
Atlanta	0	0	3	0	2	0	0	1	3	0	0	3
Brunswick	0	0		0	0	1	1	0	1	0	0	0
Savannah	0	0		0	0	0	0	0	0	0	0	0
Florida:												
Tampa	0	0	1	0	0	2	0	3	0	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	1	0	1	0	10	0	1	0	0	10
Nashville	0	0		0	2	0	0	1	1	0	0	2
Alabama:												
Birmingham	0	0		0	1	1	6	0	1	0	1	0
Mobile	1	0		1	0	1	1	0	0	0	1	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	1	0	0	0	0	4
Louisiana:												
New Orleans	0	0	3	0	6	0	11	0	1	0	1	0
Shreveport	0	0		0	0	0	4	1	1	0	1	0
Texas:												
Dallas	1	0		0	0	0	4	2	0	0	0	1
Galveston	0	0		0	0	0	3	0	1	0	0	0
Houston	0	0		0	0	1	3	1	3	0	1	0
San Antonio	0	0		0	0	0	3	0	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	0	0	0	0	0	3
Great Falls	0	0	----	0	0	0	0	0	8	0	0	0
Helena	0	0	--	0	0	0	0	0	0	0	0	0
Missoula	0	0	----	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	2	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	2	0	1	0	1	0	4	0	5	0	0	17
Pueblo	0	0	----	0	0	0	0	0	1	0	0	0
Utah:												
Salt Lake City	0	0	----	0	5	0	0	0	6	0	0	19

City reports for week ended August 5, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	0	0		0	4	0	2	0	5	0	0	2
Spokane	2	0		0	7	1	2	1	2	0	0	2
Tacoma	0	0		0	1	0	0	0	2	0	0	4
California												
Los Angeles	1	0	2	1	48	1	7	1	12	0	1	13
Sacramento	0	0		0	14	0	4	0	3	0	0	10
San Francisco	0	0		0	54	5	3	1	2	0	0	2
Total	37	2	15	8	297	59	244	310	205	0	21	588
Corresponding week, 1943	27		29	4	676		215		203	0	25	1 153
Average, 1939–43	43		31	[1] 6	[2] 515		[1] 237		204	1	41	1 234

[1] 3-year average 1941–43
[2] 5 year median

Dysentery amebic—Cases New York 1 Columbus 1 Sacramento 1
Dysentery bacillary—Cases Buffalo 3 New York 2 St Louis 1 Charleston S C 12 Atlanta 1 Nashville 1 Shreveport 5, Los Angeles 2
Dysentery unspecified—Cases Richmond 12 Atlanta 1
Leprosy—Cases New Orleans 1
Rocky Mountain spotted fever—Cases St Louis 2 Richmond, 1
Tularemia—Cases St Louis 2 Nashville 1
Typhus fever endemic—Cases New York 1 Wilmington N C 2 Winston Salem 1 Charleston S C, 6 Atlanta, 1 Brunswick 1 Savannah 3 Tampa 5, Mobile 2 New Orleans 2 Dallas 2 Houston 7 San Antonio 3 Los Angeles 1

Rates (annual basis) per 100 000 population, by geographic groups, for the 86 cities in the preceding table (estimated population, 1943, 33,904,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	3.1	0.0	0.0	3.1	97	22.0	59.7	6.3	66	0.0	15.7	69
Middle Atlantic	3.2	0.5	1.4	1.4	20	8.3	34.7	78.2	19	0.0	2.3	48
East North Central	8.0	0.0	0.0	0.6	25	6.8	22.9	42.1	35	0.0	3.1	144
West North Central	4.0	0.0	0.0	2.0	54	15.9	41.8	37.8	28	0.0	0.0	60
South Atlantic	8.2	1.6	8.2	0.0	18	8.2	39.2	71.9	29	0.0	0.0	183
East South Central	5.9	0.0	5.9	5.9	24	11.8	100.3	5.9	18	0.0	11.8	71
West South Central	2.9	0.0	8.6	0.0	17	2.9	83.2	11.5	20	0.0	8.6	14
Mountain	31.8	0.0	7.9	0.0	48	0.0	31.8	0.0	159	0.0	0.0	310
Pacific	4.7	0.0	3.2	1.6	202	11.1	28.5	4.7	41	0.0	1.6	52
Total	5.7	0.3	2.3	1.2	46	9.1	37.6	47.8	32	0.0	3.2	91

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (human).—On July 22, 1944, 1 death from bubonic plague (diagnosis confirmed) was reported in the Hamakua District, Island of Hawaii, T. H. This death occurred about 5¼ miles from the locality of the last previously reported death. Four deaths from plague have previously been reported this year, occurring on January 19, January 26, February 10, and March 10, 1944, respectively.

FOREIGN REPORTS

CANARY ISLANDS

Malaria.—According to information dated July 11, 1944, from the American Consul at Las Palmas, malaria has become prevalent in the southern part of Grand Canary Island. For the week ended July 1, 1944, 64 cases of malaria were reported, and the total number of cases reported for the year 1943 amounted to 2,237 among the civilians and 500 cases among the military population. The disease is said to be of a mild character, but it is stated that there is danger of its spreading.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-May 1944	June 1944	July 1944—week ended—				
				1	8	15	22	29
ASIA								
Ceylon	C	2						
India	C	79,584	29,669					
Calcutta	C	2,062	549	74	41			
Chittagong	C	63						
Madras	C	36						
Negapatam	C	17						

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January-May 1944	June 1944	July 1944—week ended—				
				1	8	15	22	29
AFRICA								
Belgian Congo	C	3	1					
Plague-infected rats		P						
British East Africa:								
Kenya	C	1		1	1			
Uganda	C	4	1					
Egypt	C	518	79	7	27	7		
Port Said	C	13	22	5	12	5		
Suez	C	152	5					
French West Africa: Dakar	C	16	35			[1] 30		
Madagascar	C	65						
Morocco (French)	C	57	13				6	
Rhodesia, northern	C	1			1			
Senegal	C		2					
Union of South Africa	C	23						
ASIA								
China: Foochow	C	P						
India	C	6,718	42					
Indochina	C	49	6					
Palestine	C	1		1			1	

[1] For the period July 1-10, 1944.

PLAGUE—Continued

Place		January–May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
EUROPE								
Portugal: Azores	C	7	2	1		1		
SOUTH AMERICA								
Bolivia:								
Chuquisaca Department	C	4						
Tarija Department	C		6					
Ecuador: Chimborazo Department	C	1						
Peru:								
Ancash Department	C	44	16					
Lambayeque Department	C	1						
Libertad Department	C	5						
Lima Department	C	17						
Piura Department	C	2						
OCEANIA								
Hawaii Territory:								
Hamakua District	D	[2] 4					1	
Plague-infected rats [3]		[4] 41	1		2			

[2] Includes 1 death from pneumonic plague.
[3] 53 fleas were also proved positive for plague on Mar. 7, 1944.
[4] Includes 12 plague-infected mice.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		January–May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
AFRICA								
Algeria	C	595	83					
Angola	C	20						
Basutoland	C	130						
Belgian Congo	C	993	153	21	54			
British East Africa:								
Kenya	C	2,483	147	54	42	25		
Mombasa	C	135	7			1		
Tanganyika	C	977	685	42	217			
Uganda	C	1,874	351	149	172	119		
Cameroon (French)	C	348						
Dahomey	C	59	6					
Egypt	C	9,426	468	133	128			
French Equatorial Africa	C	837						
French Guinea	C	482	284					
French West Africa: Dakar	C	11	14					
Gambia	C	13						
Gold Coast	C	5						
Ivory Coast	C	385						
Mauritania	C		1					
Morocco (French)	C	592						
Mozambique	C	1						
Nigeria	C	2,620	401	74	43			
Niger Territory	C	518	23					
Senegal	C	122	25					
Sierra Leone	C	393						
Sudan (Anglo-Egyptian)	D		1					
Sudan (French)	C	1,821	44					
Tunisia	C	5						
Union of South Africa	C	52	62	19	15	15		
ASIA								
Arabia	C	[1] 9						
Ceylon	C	8						
China: Kunming (Yunnan Fu)	C	40	3	1	7	1		
India	C	178,969	20,030					
Indochina	C	1,381	136					
Iran	C	1						
Iraq	C	27	4		1			
Palestine	C	104	32	15		7		
Syria and Lebanon	C	170	3	3				

[1] Includes 4 imported cases.

SMALLPOX—Continued

Place		January–May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
EUROPE								
Gibraltar	C	P						
Great Britain	C	[2] 16	1		1			
Greece	C	317						
Italy	C	142	133					
Portugal	C	14	13	1			2	
Spain	C	131	16					
Turkey	C	5,550						
NORTH AMERICA								
Guatemala	C	1	3					
Honduras	C	8	1					
Mexico	C	1,484	211					
SOUTH AMERICA								
Bolivia	C	237	135					
Brazil	C	61	38	15	22	16	25	
Colombia	C	209	18	12	9	10	8	
Ecuador	C	4						
Peru	C	178						
Lima	C	19						
Venezuela	C	143	47					

[2] Includes 1 imported case from the Middle East.

TYPHUS FEVER

[C indicates cases]

Place		January–May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
AFRICA								
Algeria	C	725	126					
Basutoland	C	4						
Belgian Congo	C	7	3					
British East Africa. Kenya	C	7						
Egypt	C	12,297	1,280	485	284			
French West Africa: Dakar	C	15	1					
Gold Coast	C		4					
Morocco (French)	C	1,608						
Morocco (Spanish)	C	6						
Mozambique	C	2						
Nigeria	C	2						
Rhodesia, northern	C	17	23					
Sierra Leone	C	30						
Tunisia	C	520	56					
Union of South Africa	C	4,184	51	26				
ASIA								
Arabia: Western Aden Protectorate	C	[1] 15						
Ceylon	C			1				
China: Kunming (Yunnan Fu)	C	39	6	3	2		4	
India	C	3	3					
Indochina	C	867	108					
Iran	C	5,747						
Iraq	C	496	40					
Palestine	C	357	29	7	16	3		
Syria and Lebanon	C	389	33					
Trans-Jordan	C	24						
EUROPE								
Belgium	C	8	1					
Bulgaria	C	624						
France	C	6						
Greece	C	146						
Hungary	C	2,231	505	101		[2] 159		
Irish Free State	C	3	3				1	
Netherlands	C	8						
Norway	C	1						
Portugal	C	1	1	2				
Rumania	C	5,178						
Slovakia	C	308	8					
Spain	C	391	10					
Turkey	C	2,076						
Yugoslavia	C	5,055	1,209					

[1] A report dated Mar. 30, 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia.

TYPHUS FEVER—Continued

Place		January-May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
NORTH AMERICA[2]								
Costa Rica	C	2						
Dominican Republic	C	4	6					
Guatemala	C	1 194	176					
Jamaica	C	26	13	2				
Mexico	C	950	105					
Panama Canal Zone	C	1						
Puerto Rico (endemic)	C	54	28	10	8	18	5	
Salvador	C	3	1					
Virgin Islands	C	2						
SOUTH AMERICA								
Bolivia	C	69	39					
Brazil	C	1	1					
Chile	C	166	46					
Colombia	C	82	24					
Curacao	C	1			1			
Ecuador	C	150						
Peru	C	304						
Venezuela	C	34	12					
OCEANIA								
Australia	C	91	35	2	3	1		
Hawaii Territory	C	28	6		2	2		

[1] For 2 weeks

[2] Cases of typhus fever listed in this area are probably of endemic type

YELLOW FEVER

[C indicates cases D deaths]

Place		January-May 1944	June 1944	July 1944—week ended— 1	8	15	22	29
AFRICA								
Belgian Congo								
Bebeyru	D	1						
Bondo	D	1						
Leopoldville	C	1						
Gold Coast								
Kintampo	C	1						
Tamale	C	1						
Ivory Coast	C				[1] 1			
EUROPE								
Portugal Lisbon [2]								
SOUTH AMERICA								
Bolivia								
La Paz Department	C	1						
Santa Cruz Department	C	3						
Brazil								
Acre Territory	D	1						
Matto Grosso State	D	3						
Para State	D	2						
Colombia								
Boyaca Department	D	2						
Caldas Department	D	1						
Cundinamarca Department	D	1						
Santander Department	D	4						

[1] Suspected

[2] According to information dated Jan 21 1944 it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon Portugal with cases of yellow fever on board

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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THE INFLUENZA EPIDEMIC OF THE WINTER OF 1943–44 IN THE UNITED STATES: A PRELIMINARY SUMMARY [1]

By DOROTHY F. HOLLAND, *Statistician*, and SELWYN D. COLLINS, *Head Statistician, United States Public Health Service*

An outbreak of a mild type of influenza started in Minnesota and the Great Lakes region about the middle of November 1943. From the North Central region as the area of origin, the epidemic spread eastward to New England, the Middle Atlantic States, and Kentucky, Virginia, West Virginia, Delaware, and Maryland, outbreaks being reported subsequently in the Mountain and Pacific States, the Southeast (Central and Atlantic) and, finally, in the West South Central States. The Army as well as the civilian population experienced the epidemic, the direction of spread in the two groups showing general correspondence (*1*). The peak of the epidemic in the civilian population (considering the country as a whole) occurred during the last week of December and the first week of January. It appears that the epidemic in the Army began to subside somewhat earlier, the incidence rates having shown a decline as of the middle of December except in stations in the South and Southwest, which were the last to experience the outbreak.

The tendency of influenza to occur in pandemic form "in cycles with intervals of several decades" (*2*) led to general concern that the 1943 outbreak might assume the characteristics of the 1918 pandemic. This early apprehension was increased by the fact that in November, when the first indications of an outbreak were observed in this country, influenza had already attained epidemic proportions in England and Wales. However, the sharp rise in influenza deaths in the 126 great towns of England and Wales in November and December was found to be due not to the virulence of the causative organism, but to a high

[1] The United States Public Health Service makes grateful acknowledgment of the cooperation of the Hospital Service Plan Commission, American Hospital Association, and member plans, in making available reports of influenza-pneumonia admissions during the epidemic. Special thanks are extended to the Commission for permission to publish these data.

case incidence. The subsequent course of the outbreak in the United States, as well as the experience of other countries in which influenza has been epidemic in the winter of 1943–44, gives no evidence of a recurrence of the severe type of influenza observed in the 1918 pandemic.

Characteristic features of the disease in the recent epidemic were the sudden onset, moderate prostration, fever, and general pains, followed by marked weakness. The duration has been variously reported as between 3 and 5 days. As a result of the characteristic short duration of the illness, the term "lightning" influenza was used in newspaper reports of the epidemic in England. Complications have been infrequent and usually not serious. The excess mortality associated with the epidemic resulted from the high incidence of cases rather than a high case fatality rate. The laboratory evidence available indicates that the recent outbreak was probably largely due to influenza virus A (*3*, *4*). The type A virus was also identified during the epidemic in England and Wales.

MORBIDITY

Total incidence.—It is generally recognized that official reports of influenza cases in this country inadequately describe the actual incidence and severity of the disease and the geographic spread and trend of an epidemic. Influenza is now notifiable in all but 4 States, New Hampshire, Massachusetts, Pennsylvania, and New York; and while reporting is required in New York City, the actual number of cases reported in the recent epidemic was so small as effectively to exclude the entire State from the reporting area. Three States not included in the reporting area, Massachusetts, Pennsylvania, and New York (considering the State as a whole), are populous, containing together about one-fifth of the total population of the country. Officially reported cases of influenza for the country as a whole, and particularly for New England and the Middle Atlantic divisions, are therefore substantially understated by the failure of these States to require its notification. Furthermore, official requirement of notification in no sense insures completeness of reporting. As a result of the mild form of the disease in the recent outbreak, many cases were not attended by a physician, necessarily understating the true incidence. The time lag between the onset of the outbreak and the identification of cases as influenzal in type limits the value of officially reported cases as a measure of epidemic trend. In the recent epidemic, a further limitation resulted from the practice adopted by certain States of estimating the incident cases in the total population on the basis of the experience of selected groups, such as school children or industrial workers.

Notwithstanding these limitations, the weekly trend of the epidemic as indicated by influenza cases reported to the Public Health Service

by State health officers is of interest. As is shown in table 1, the incidence in the country as a whole showed a continuous upward trend for a 7- to 8-week period beginning about the middle of November 1943, the rise being particularly marked during December. Subsequent to the week ended January 8, 1944, the decline in incidence has been progressive. The reported case incidence in the recent influenza epidemic appears to have been about of the same order as in the

TABLE 1.—*Telegraphic reports of influenza cases from State health officers to the U. S. Public Health Service, weeks ended Nov. 13, 1943, through Feb. 5, 1944, and the corresponding weeks of 1940–43 compared—all reporting States* [1]

Week ended [2]	Number of influenza cases reported			
	1943–44 [3]	1942–43	1941–42	1940–41
Feb. 5	[4] 14 912	4 327	5 667	61 809
Jan. 29	22 483	4 852	4 809	91 203
22	47 143	4 387	4 332	107 270
15	5 649	4 330	3 894	95 695
8	126 610	3 872	3 800	77 820
1	[5] 124 486	3 440	2 587	45 475
Dec. 25	83 973	2 290	2 693	42 457
18	82 951	2 414	2 995	29 864
11	23 746	2 604	2 742	9 663
4	4 489	1 928	2 478	3 014
Nov. 27	2 465	1 854	2 469	1 332
20	1 734	1 769	2 372	1 180
13	1 555	1 596	2 308	787

[1] Influenza is not reportable in the following States: Massachusetts, New Hampshire, New York (except New York City), and Pennsylvania. New Hampshire and Pennsylvania have submitted reports of influenza cases for certain weeks in the period 1940–44; these reports are therefore included, but the number of cases is negligible. No reports of influenza cases have been received from Massachusetts in the period considered. The totals include cases for New York City, in which influenza is reportable, but no cases for up-State New York were reported in the period considered.

Influenza is reportable in Mississippi, but it appears that notification is not enforced, 1 cases having been reported in the period considered.

[2] The ending dates of the weeks specified are as of 1943 and 1944. The weeks in the preceding years correspond in number, taking the weeks ended January 4–10 as the first week of the year.

[3] The figure reported by Kentucky for the week ended Dec. 18, 1943, was estimated in part and does not represent exclusively cases reported by physicians. The trend in the total cases reported therefore is indicated more exactly if the figures for Kentucky are omitted.

The total for the reporting States exclusive of Kentucky is as follows: Week ended Dec. 4, 1943, 4,486; Dec. 11, 18,330; Dec. 18, 48,803; Dec. 25, 81,753; Jan. 1, 1944, 105,997; Jan. 8, 103,825; Jan. 15, 63,722; Jan. 22, 46,264; Jan. 29, 21,638; Feb. 5, 14,214.

See also footnote 6, table 2.

[4] In the weeks ended Feb. 12 through Mar. 4, 1944, the incidence of influenza showed some excess over the 1942–43 average for corresponding weeks, the number of cases reported for weeks ended on the specified dates being as follows: Feb. 12, 10,748; Feb. 19, 7,189; Feb. 26, 6,425; Mar. 4, 5,249. In the weeks ended Mar. 11 through Apr. 1, the reported cases continued to decline, falling below the 1942–43 average for corresponding weeks.

[5] In the week ended Dec. 25, 1943, Louisiana reported 148 cases, and in the week ended Jan. 1, 1944, 4,136 cases. A later mail report indicated that this marked increase was due in part to a change in the method of reporting cases, the total number of cases seen by physicians being substituted for individual reports of cases by name.

Exclusive of a delayed report of 1,000 cases from Wyoming.

epidemic of 1940–41. However, the 1940–41 epidemic was minor measured in terms of the total excess death rate from influenza-pneumonia (*5*), while from the standpoint of mortality from all causes the recent epidemic was comparable in severity to that of 1928–29, the major epidemic since the period 1918–20.

Table 2 summarizes the weekly incidence of influenza cases reported to the Public Health Service, by geographic division and State. It should be noted that the trend in incidence may vary widely among the States within a given geographic division, limiting the significance of

the division totals. However, with the exceptions noted in the table, the figures are broadly indicative of the epidemic trend in a given State. Interstate comparisons of the magnitude of the case incidence are not significant due to lack of uniformity among the States in the completeness of notification.

TABLE 2.—*Telegraphic reports of influenza cases from State health officers to the U S Public Health Service, weeks ended Nov 13, 1943, through Feb 5, 1944, by geographic division and State* [1]

Geographic division and State	Number of influenza cases reported week ended—												
	November 1943			December 1943				January 1944					February 1944
	13	20	27	4	11	18	25	1	8	15	22	29	5 [2]
Reporting States—Total [3]	1,555	1 734	2 465	4 489	23 746	82 951	83 973	[4] 126 488	126 610	65 649	47 143	22 483	14,912
New England [1]	1	3	32	54	121	344	929	1 019	560	227	328	137	130
Maine			31	1	22	88	62	87	73	28	21	41	26
New Hampshire [1]						2			3		12		20
Vermont								189	100	28	221	19	51
Massachusetts [1]													
Rhode Island				1	1	35	35	60	77	13	31	24	25
Connecticut	1	3	1	52	98	219	832	683	307	158	43	53	8
Middle Atlantic [1]	7	24	11	36	133	564	889	526	225	141	80	59	53
New York [1]	3	5	3	14	70	357	475	199	70	28	15	15	12
New Jersey	2	16	7	17	50	163	351	270	126	85	38	24	33
Pennsylvania [1]	2	3	1	5	13	44	63	57	29	28	27	20	8
East North Central	163	36	41	122	930	5,620	10 236	11 132	8 959	5 766	1,712	907	410
Ohio	4	3	12	1	4	2 625	6 986	8 037	5 345	4 212	475	72	61
Indiana	45	9	3	59	286	1,469	677	117	194	129	67	134	35
Illinois	9	4	6	18	447	416	437	361	211	67	267	68	54
Michigan	87	2	1	7	63	148	304	294	27	61	55	32	15
Wisconsin	18	18	19	37	130	962	1 832	2 323	3 162	1 297	848	601	245
West North Central	8	17	432	436	7 398	6 639	14 087	7 647	5 749	3 087	5 588	327	266
Minnesota		1	270	273	396	185	16	18		3	5		2
Iowa					2 337	4 002	11 463	4 377	3 860	1,839	5 112	251	37
Missouri	3	3	149	21	137	149	100	68	132	40	17	5	27
North Dakota			5	23	4 331	1 141	1 443	595	421	301	105	14	12
South Dakota		1				25	39	1	9		21		4
Nebraska	5	3	3	88		349	51	393	171	60	84	3	102
Kansas		9	5	31	197	788	975	2 195	1,156	844	244	54	82
South Atlantic	446	507	649	1,227	4,035	15,920	16,425	35,978	32,635	19,459	10,209	5,437	3,953
Delaware						4							
Maryland		2	6	6	62	218	696	586	2,354	876	55	267	115
District of Columbia	2		4	4	248	1,349	845	603	1 138	62	44	5	9
Virginia	107	168	259	651	1,649	9,349	7,584	9,600	8,335	7,721	3,819	2,404	1,733
West Virginia	2		5	1	629	2,062	3,747	12,068	10,536	3,394	1,440	354	464
North Carolina		1	7	1	3	119	76	223	419	158	214	45	78
South Carolina	305	295	331	453	755	1,498	1 958	6,155	6,702	5,498	3,799	1,878	1,311
Georgia	19	34	30	105	676	1,219	1,405	6,513	3,054	1,634	767	408	227
Florida	11	7	7	6	16	102	114	140	97	116	71	76	16
East South Central [1] [5]	70	86	111	428	6,007	35,425	4,775	29,266	28,945	6,117	4,176	2,528	1,306
Kentucky	8	1	1	8	[6] 5,416	[6] 34,148	2,220	20,491	22,785	1,927	879	845	668
Tennessee	15	25	56	155	285	391	982	1,753	2,276	913	845	419	156
Alabama	52	60	54	270	306	886	1,573	7,022	3,884	3,277	2,452	1,264	482
Mississippi [1]											-		---
West South Central	705	815	971	1,546	3,633	9,029	15,652	[7] 25,686	37,332	23,736	19,069	9,503	6,696
Arkansas	26	45	89	184	427	2,663	4,090	5,345	5,462	2,420	1,345	862	475
Louisiana	11	15	1	35	84	58	148	[7] 4,136	4,106	6,430	5,603	1,990	1,266
Oklahoma	38	39	74	29	201	999	2,022	2,875	3,310	1,760	2,061	661	567
Texas	630	716	807	1,298	2,921	5,309	9,392	13,330	24,454	13,126	10,060	5,990	4,388

See footnotes at end of table.

TABLE 2.—*Telegraphic reports of influenza cases from State health officers to the U. S. Public Health Service, weeks ended Nov. 13, 1943, through Feb. 5, 1944, by geographic division and State* [1]—Continued

Geographic division and State	Number of influenza cases reported, week ended—												
	November 1943			December 1943				January 1944					February 1944
	13	20	27	4	11	18	25	1	8	15	22	29	5 [2]
Mountain	137	224	179	579	1,393	5 975	11,911	[8] 7,774	7,169	4,006	4,017	2,720	1,611
Montana	1	5	6	2	34	2,468	2,654	2,521	1,665	654	484	517	149
Idaho				2	2	4	12	29	17	2	30		5
Wyoming	2	1	2	2	11	227	814	[8] 952	804	334	182	205	12
Colorado	15	30	12	238	322	820	1,041	808	847	840	788	298	175
New Mexico		19	4	21	18	124	28	81	9	20	20	32	3
Arizona	116	163	155	313	950	1,106	731	824	589	541	496	543	355
Utah		6		1	56	1,205	5,723	1,767	2,030	1 477	1,945	1,115	798
Nevada	3	-				21	908	792	1,208	138	82	10	114
Pacific	18	22	39	61	96	3,435	9 069	7,460	5 036	3,110	1,964	865	487
Washington	-	-	1	6	2	1 490	3,200	220	453	45	134	3	5
Oregon	6	3	11	4	25	760	2 201	2,811	1 325	534	396	157	93
California	12	19	27	51	69	1 185	3,668	4 429	3 258	2,531	1,434	705	389

[1] See footnote 1, table 1
[2] See footnote 4, table 1
[3] See footnote 3, table 1
[4] See footnote 5, table 1
[5] See the first paragraph of footnote 3, table 1
The number of cases for the East South Central Division exclusive of Kentucky, is as follows Week ended Dec 4, 1943, 427, Dec 11, 591, Dec 18 1 277, Dec 25 2 555, Jan 1, 1944, 8,775, Jan 8, 6,160, Jan 15, 4,190, Jan 22, 3,297, Jan 29, 1,683, Feb 5, 638
[6] A later mail report from Kentucky gave an estimated total of more than 35,000 cases for the week ended Dec 11, 1943, of which an estimated total of 30 000 was included in the telegraphic report for the week ended Dec 18, 1943
[7] See the first paragraph of footnote 5, table 1
[8] See the second paragraph of footnote 5, table 1

Hospital incidence.—Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, the weekly incidence of hospitalized illness due to pneumonia, influenza, and other upper respiratory diseases among beneficiaries of 14 Blue Cross Hospital Service Plans has been made available to the Public Health Service. The 14 reporting Blue Cross Plans were located in metropolitan communities in 11 States, all geographic regions except the Southeast, South Central, and Pacific being represented by at least one plan.

The trend in hospital admissions with a diagnosis of pneumonia, influenza, or other upper respiratory infections shows general correspondence with the trend of the total case incidence (as indicated by reported cases of influenza) in a given area (table 3). Thus, the maximal number of influenza-pneumonia hospital admissions in St. Paul occurred in the week ended December 4, 1943, with a secondary peak 2 weeks later. This result is consistent with the early peak observed in the total incidence of influenza in Minnesota, this State being one of the first to experience the outbreak. The week ended December 18, the peak week in the hospital incidence of influenza-pneumonia as reported by Group Hospital Service, St. Louis, corresponds with the

peak week in total incidence for Missouri, based on officially reported influenza cases. The subsequent spread of the epidemic to the Middle Atlantic States likewise is reflected in the high hospital incidence of influenza-pneumonia in the period December 11–January 1 reported by the Blue Cross Plans in New York City, Buffalo, Syracuse, and Philadelphia. However, the influenza-pneumonia hospital incidence

TABLE 3.—*Hospital admissions with a diagnosis of influenza or pneumonia as a percent of total hospital admissions, weeks ended Nov 6, 1943, through Jan. 29, 1944, as reported to the Hospital Service Plan Commission of the American Hospital Association by representative Blue Cross Hospital Service Plans—data made available to the U S Public Health Service*

Location of reporting Blue Cross Plan	Week ended— November 1943				December 1943				January 1944				
	6	13	20	27	4	11	18	25	1	8	15	22	29
	PERCENT, INFLUENZA PNEUMONIA [1] HOSPITAL ADMISSIONS OF TOTAL ADMISSIONS												
Boston	8.2	8.2	8.2	7.7	11.3	12.1	15.8	21.6	24.4	21.5	14.6	11.7	(*)
Albany	3.0	2.9	5.3	6.5	12.1	12.9	11.8	22.7	15.8	16.5	9.3	5.1	6.9
Buffalo	(*)	(*)	(*)	(*)	(*)	(*)	23.0	18.8	18.6	16.2	7.7	4.3	5.7
Syracuse	2.8	6.1	5.8	5.5	8.7	24.6	23.6	24.8	25.3	(*)	12.5	8.3	8.4
New York City	(*)	(*)	(*)	(*)	(*)	13.9	19.5	21.7	19.9	(*)	9.7	7.4	(*)
Philadelphia [2]	(*)	(*)	(*)	(*)	8.5	12.1	20.9	20.7	16.1	16.4	9.2	8.4	4.7
Chicago [3]	2.7	3.5	3.6	3.1	(*)	3.7	7.8	11.0	15.0	(*)	14.3	10.8	(*)
Cincinnati	5.5	6.6	5.7	6.0	9.0	9.3	13.3	14.6	19.5	22.0	16.9	16.6	(*)
St Paul	2.5	3.8	3.2	7.4	9.6	3.1	10.8	8.0	6.0	6.2	6.8	3.9	3.0
St Louis	6.9	5.9	9.5	13.0	(*)	13.4	21.8	26.8	13.6	12.4	6.5	4.8	6.1
Baltimore	1.0	2.1	1.6	1.8	5.7	8.3	15.0	15.8	12.9	13.1	7.2	10.1	6.0
Richmond	10.0	0	1.0	2.9	14.6	9.3	21.1	15.8	17.0	17.8	5.7	3.7	2.7
Wilmington	5.0	3.8	10.3	21.4	18.8	30.5	11.1	16.0	16.3	(*)	4.9	(*)	(*)
Denver	6.3	11.4	12.4	15.5	20.3	20.2	27.5	34.9	21.0	15.9	12.8	5.8	5.9
All reporting Plans	4.7	5.4	5.8	7.2	10.4	10.6	16.7	18.7	17.1	15.4	10.6	8.3	4.9
	NUMBER OF INFLUENZA-PNEUMONIA [1] HOSPITAL ADMISSIONS												
All reporting Plans	293	350	378	416	577	1,168	1,624	1,524	1,846	1,040	1,129	864	244
	NUMBER OF HOSPITAL ADMISSIONS, ALL DIAGNOSES												
All reporting Plans	6,185	6,516	6,547	5,744	5,562	11,028	9,719	8,161	10,792	6,744	10,628	10,445	5,017
Number of Plans reporting	11	11	11	11	10	13	14	14	14	10	14	13	9

*No report received for the specified week

[1] Includes upper respiratory infections

[2] In November, the weekly average influenza-pneumonia admissions were 3.1 percent of total admissions for this Plan

[3] The figures relate to cases paid, not admissions

based on the combined experience of the reporting plans differs somewhat from the trend of the total incidence, since the Blue Cross data include no representation of the West South Central States.

For the week ended November 6, 1943, in the combined experience of 11 plans, influenza-pneumonia hospital admissions represented 4.7 percent of the total admissions; after a gradual increase during November and December, the proportion reached 17.1 percent in the

week ended January 1, 1944.[3] Subsequent reports showed a progressive decline in influenza-pneumonia hospital admissions, their proportion to the total having fallen to 8.3 percent in the week ended January 22 (13 plans reporting). The relative weekly number of influenza-pneumonia admissions was notably high in the experience of Blue Cross Plans in the following cities:

City	Percent of total admissions	Week ended	City	Percent of total admissions	Week ended
Boston	24 4	Jan 1, 1944	Wilmington	30 5	Dec 11, 1943
Albany	22 7	Dec 25, 1943	Richmond	21 1	Dec 18, 1943
Buffalo	23 0	Dec 18 1943	Cincinnati	22 0	Jan 8, 1944
Syracuse	25 3	Jan 1, 1944	St Louis	26 8	Dec 25, 1943
New York	21 7	Dec 25 1943	Denver	34 9	Dec 25, 1943
Philadelphia	20 9	Dec 18, 1943			

MORTALITY

The death rate from all causes during an influenza epidemic is an especially significant measure of its severity, the excess mortality relative to that in a normal (i. e., nonepidemic) period representing deaths associated with the epidemic. Weekly reports of deaths from all causes are made to the Bureau of the Census by 90 major cities with an aggregate population of nearly 40 million (*6*). Mortality in these cities began to rise early in December 1943, but the excess over the comparable period of preceding years did not become marked until the latter part of the month.

In the 90 cities considered as a group, the provisional death rate from all causes (annual basis) was 13.3 per 1,000 estimated population in the week ended December 4, 1943, and after a continuing rise in succeeding weeks, reached the peak rate of 19.4 per 1,000 in the week ended January 1, 1944, representing an excess of 6.5 deaths per 1,000 over the 1941–42 average for the corresponding week Throughout the remainder of January, the death rate in this urban population showed a marked downward trend, and has remained approximately at the expected level during February and March.

It may be assumed that a lag of about 1 week occurs between the maximal weekly case incidence and the maximal death rate. Thus, with reference to the trend of the average excess weekly death rate in these 90 cities, the epidemic appears to have reached its maximal incidence between December 18 and 25. However, the period of maximal incidence based on officially reported cases occurred between December 25 and January 8. This lack of correspondence results in part from the virtual exclusion of such populous States as

[3] The comparable figure for the week ended December 25, 1943, was 18 7 percent However, the experience of this week is believed to be atypical since it preceded Christmas, both total hospital admissions and influenza-pneumonia admissions being lower than in the prior and succeeding weeks

Massachusetts, New York, and Pennsylvania from the reporting area for official notification of influenza cases, cities in these 3 States, on the other hand, being included among the 90 cities reporting deaths. Allowance should be made for the added fact that the death rates are based exclusively on an urban experience.

Comparison of the death rate in these reporting cities grouped by geographic division, as shown in table 4, reveals several points of interest.[5] The epidemic appears to have been somewhat more

TABLE 4.—*Weekly actual and excess death rates, all causes, per 1,000 estimated population in 90 major cities of the United States, and weekly excess death rate in the reporting cities grouped by geographic division, for the weeks ended Nov. 13, 1943, through Feb. 5, 1944*[1] *(provisional rates)*

Geographic division	Week ended— November 1943			December 1943				January 1944					February 1944
	13	20	27	4	11	18	25	1	8	15	22	29	5
	DEATH RATE, ALL CAUSES, PER 1,000 POPULATION (ANNUAL BASIS)												
90 cities—total 1943–44	11.6	12.2	11.8	13.3	14.1	15.6	17.1	19.4	18.1	15.6	14.1	13.5	12.9
Average, 1941–42[2]	11.6	11.7	11.9	11.9	12.2	12.1	12.4	12.9	13.6	13.6	13.3	13.0	12.9
	EXCESS[3] DEATH RATE, ALL CAUSES, PER 1,000 POPULATION (ANNUAL BASIS)												
90 cities—total	0	+.5	−.1	+1.4	+1.9	+3.5	+4.7	+6.5	+4.5	+2.0	+.8	+.5	0
Reporting cities in specified division[4]													
New England	+1.4	+.8	+.2	+2.0	+1.8	+3.7	+6.1	+8.7	+8.2	+5.6	+.6	+1.6	−.5
Middle Atlantic	−.3	+.4	+.1	+1.9	+2.8	+4.8	+7.9	+8.7	+5.8	+2.4	+1.2	+.6	−.3
East North Central	0	+.2	+.3	+1.4	+2.2	+3.4	+3.4	+5.8	+4.5	+1.7	+.9	+.3	+.2
West North Central	+.2	+1.3	−.6	+2.2	+2.8	+7.6	+5.3	+5.5	+2.6	+1.8	0	+.4	+1.2
South Atlantic	−1.1	−1.2	−.7	+1.2	+1.0	+2.8	+3.6	+7.4	+2.1	+1.5	+.1	+.6	−.6
East South Central	+2.6	+1.1	−1.1	+1.7	+1.1	+2.8	+1.7	+5.8	+4.2	+2.4	+1.9	+2.7	+1.4
West South Central	−2.0	+.4	+.2	+.4	+1.1	+.7	+1.9	+4.1	+2.6	+3.2	+2.2	0	+.3
Mountain	+.3	+1.3	+1.1	+1.1	+2.1	+5.3	+3.5	+4.[illegible]	+1.6	+.6	−.8	−2.3	+1.0
Pacific	−.1	+.4	−2.1	+.2	−.8	−.2	+.7	+1.9	+2.9	+.2	−.6	−.4	−.6

[1] Computed from telegraphic reports of deaths as published in the Weekly Mortality Index of the U. S. Bureau of the Census, Washington, D. C. Populations used are estimates as of Nov. 1 of 1943, 1942, and 1941 as computed from U. S. Bureau of the Census releases giving estimates of the civilian population by counties as of May 1, 1942 (Series P-3, No. 33, 2-25-43), Mar. 1, 1943 (Series P-3, No. 38, 10-31-43), and Nov. 1, 1943 (Series P-44, No. 3, 2-15-44). Because of considerable shifts in population in 1943, the rates in this table differ considerably from similar rates in the Public Health Reports for Jan. 21 and Feb. 18, 1944, which were prepared before the November 1943 population estimates were available.

[2] 3-week moving average of average rates for corresponding weeks of 1941–42 and 1942–43.

[3] Excess over 3-week moving average of average rates for corresponding weeks of 1941–42 and 1942–43.

[4] The same 90 cities are used in all 3 years throughout this table, practically all having populations of 100,000 or more in 1940. The cities classified by geographic division are as follows: New England (14 cities): Boston, Bridgeport, Cambridge, Fall River, Hartford, Lowell, Lynn, New Bedford, New Haven, Providence, Somerville, Springfield, Mass., Waterbury, Worcester; Middle Atlantic (17 cities): Albany, Buffalo, Camden, Elizabeth, Erie, Jersey City, Newark, N. J., New York, Paterson, Philadelphia, Pittsburgh, Rochester, N. Y., Schenectady, Syracuse, Trenton, Utica, Yonkers; East North Central (18 cities): Akron, Canton, Chicago, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Evansville, Flint, Fort Wayne, Grand Rapids, Indianapolis, Milwaukee, Peoria, South Bend, Toledo, Youngstown; West North Central (9 cities): Des Moines, Duluth, Kansas City, Kans., Kansas City, Mo., Minneapolis, Omaha, St. Louis, St. Paul, Wichita; South Atlantic (8 cities): Atlanta, Baltimore, Miami, Norfolk, Richmond, Tampa, Washington, D. C., Wilmington, Del.; East South Central (5 cities): Birmingham, Knoxville, Louisville, Memphis, Nashville; West South Central (7 cities): Dallas, El Paso, Fort Worth, Houston, New Orleans, Oklahoma City, San Antonio; Mountain (2 cities): Denver, Salt Lake City; Pacific (10 cities): Long Beach, Los Angeles, Oakland, Portland, Oreg., Sacramento, San Diego, San Francisco, Seattle, Spokane, Tacoma.

[5] The rates shown in table 4 supersede similar rates published in two earlier numbers of PUBLIC HEALTH REPORTS: Prevalence of communicable diseases in the United States, December 5, 1943–January 1, 1944, Pub. Health Rep., 59 (79–86) Jan. 21, 1944, and Prevalence of communicable diseases in the United States, January 2–29, 1944, Pub. Health Rep., 59: 236–242 (Feb. 18, 1944), which were computed prior to the release of the estimates of the civilian population by county as of Nov. 1, 1943.

severe in southern New England and the Middle Atlantic States than in other divisions, a conclusion not indicated by the case incidence due to the incompleteness of official reports or lack of the requirement for notification of influenza in several States of this region. With respect to the epidemic trend in a given geographic division, the excess death rate in the selected urban population and the incidence based on officially reported cases in most instances are consistent. The secondary peak in the death rate in the West North Central cities occurring in the week ended January 1 is consistent with the peak in incidence for the total population of the division (excluding the Dakotas, whose urban population is not represented in the mortality reports). However, in Minnesota and Missouri the epidemic began to subside earlier than in the other West North Central States, this earlier peak in incidence being reflected in the occurrence of a primary peak in the urban death rate in the week ended December 18. The validity of the trend in case incidence based on officially reported cases in the West South Central States in general is confirmed by the trend in the excess death rate. In the division as a whole, the peak in case incidence occurred in the week ended January 8, being reflected in the persistence of a marked excess death rate in the urban population as late as the week ended January 15. It is believed, however, that incomplete or delayed reporting in certain States of this division has obscured the primary peak in incidence which was followed by the high death rate of the week ended January 1.

For the whole group of 90 large cities, the mortality from all causes in excess of the normal expectancy during the 11 weeks from November 21, 1943 to February 5, 1944, amounted to 50 per 100,000 population. This figure may be compared with total excess rates from all causes for a group of 35 large cities of 65 per 100,000 for the epidemic of 1928–29; 48 for that of 1926, 50 for that of 1923, 34 for that of 1922, 125 for the epidemic of 1920, and 598 for the pandemic of 1918–19. Comparable data are not available for the several epidemics since 1930, but they were all smaller than those of 1928–29, 1926, and 1923. During the peak week ended January 1, 1944, the excess mortality from all causes in the current epidemic was larger than in the peak week of the epidemic of 1928–29, but the total excess during the whole epidemic was considerably smaller, 50 as compared with 65 per 100,000 for 1928–29. Thus the current outbreak was larger than any epidemic since 1928–29, but caused only about 8 percent as many excess deaths in the United States as the 1918 pandemic.

EPIDEMIC INFLUENZA OUTSIDE THE UNITED STATES

Epidemics of a mild form of influenza and other upper respiratory infections were reported from many areas of North and South America during the past winter. An outbreak began in Canada about the

middle of November, the trend in incidence corresponding to that observed in Minnesota and the Great Lakes States. On the other hand, the course of the outbreaks in the border States of Mexico was roughly parallel to the epidemic trend in Texas, some areas reporting a peak in incidence about the middle of January, while in other areas the incidence remained high throughout the month. Epidemics were reported in Honduras, Haiti, Jamaica, Martinique, and Curacao in November and December. In Venezuela, widespread epidemics occurred late in November and December, the peak being reached by the middle of January except in certain cities of the interior. Reports of epidemics appearing in British and Dutch Guiana in January suggest that the disease spread from Venezuela to the southeast. An outbreak of influenza started in Recife, on the northeast coast of Brazil, in the middle of December. It is reported that the Brazilian health authorities were greatly alarmed over the possible spread of the epidemic, as a result of which the newspapers published general instructions for the control of influenza, and all vitamin preparations and sulfonamides were officially exempt from import duties for a 6-month period beginning early in January. However, information available to date gives no indication of the extension of the epidemic toward the southern part of Brazil. Southern Brazil, as well as Paraguay, Uruguay, Argentina, and Chile, are now in their summer season, in which outbreaks of respiratory disease are not frequent.

Official reports on the prevalence of influenza in continental Europe are fragmentary. A mild type of influenza has been epidemic in Spain since November, the incidence having declined to normal in January in the provinces from which official reports have been received. A press report via Berne noted the occurrence of a widespread epidemic of influenza in northern Italy in the middle of December. An official report made early in February indicated that influenza was then epidemic in Denmark, France, and Switzerland. With the exception of Tangier and Spanish Morocco, North Africa appears to have experienced no abnormal incidence of influenza during the past winter.

An interesting feature of the epidemic in England and Wales, to which earlier reference has been made, was the action taken to relieve the acute shortage of civilian medical personnel resulting from the war. Early in December, an arrangement was made for the deferment from induction into the Services of some 300 junior house physicians. In addition, the Royal Army Medical Corps made available hundreds of Army doctors to assist in the care of influenza cases among civilians, representing the first instance of such cooperation between military and civilian medical personnel. While the war has caused some depletion of the supply of physicians in the United States, the number of physicians relative to the civilian population is still substantially in excess of the ratio prevailing in England. In Decem-

ber, liaison officers of the United States Public Health Service, at the request of the Surgeon General of the Army, surveyed possible medical needs arising from the influenza epidemic in this country, but the results indicated no need for such emergency action as the English situation required.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

July 16–August 12, 1944

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended August 12, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Diphtheria.—During the current year the downward trend of diphtheria cases has been interrupted for the first time since 1939. For the 4 weeks ended August 12 there were 713 cases reported, as compared with 607 for the corresponding period in 1943 and a 5-year (1939–43) median of 613 cases. Every section of the country except the Middle Atlantic and East North Central sections showed some increase over the medians, but the greatest excesses were reported from the South Central and Pacific sections.

Influenza.—The number of cases (1,667) of influenza reported during the current 4-week period was only about 75 percent of the number reported for the corresponding period in 1943, but it was about 10 percent above the preceding 5-year median. The New England and South Central sections reported more cases than normally occur

in those sections, but in other sections the incidence either closely approximated the median or fell considerably below it.

Meningococcus meningitis.—For the 4 weeks ended August 12 there were 712 cases of meningitis reported. During the corresponding period in 1943 there were 826 cases, and the 1939–43 median was 122 cases; the median was based on 3 nonepidemic and 2 epidemic years. The incidence was lower than in 1943 in all sections except the West North Central and South Central regions, but in all sections the incidence was considerably above the 5-year median. The lowest incidence of this disease is normally reported during the latter part of August and, while the number of cases has been relatively high, the rate of decrease compares favorably with preceding years.

Poliomyelitis.—The number of cases of poliomyelitis rose from 1,100 during the preceding 4 weeks to 3,253 during the 4 weeks ended

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period July 16–August 12, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	713	607	613	1,667	2,268	1,476	6,201	12,005	10,086
New England	19	13	16	23	1	3	575	1,305	1,297
Middle Atlantic	58	47	68	14	22	18	1,125	3,245	3,213
East North Central	78	83	99	54	81	91	976	3,972	2,607
West North Central	53	50	50	15	13	14	300	755	387
South Atlantic	136	133	133	518	887	554	528	741	409
East South Central	74	50	50	103	108	85	95	153	153
West South Central	159	126	107	833	842	636	509	341	341
Mountain	55	28	50	71	192	159	250	492	407
Pacific	81	77	61	36	122	83	1,843	1,001	1,001
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	712	826	122	3,253	1,685	783	3,184	2,888	2,888
New England	61	82	6	94	82	27	271	382	274
Middle Atlantic	179	214	31	1,382	83	81	564	485	588
East North Central	107	148	13	495	158	158	816	586	779
West North Central	56	52	8	129	230	69	286	234	289
South Atlantic	115	129	22	598	29	65	377	313	268
East South Central	44	41	20	342	30	42	125	139	169
West South Central	46	38	15	90	536	63	137	120	112
Mountain	14	19	4	17	67	22	174	207	100
Pacific	90	103	7	106	470	143	434	422	243
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	21	23	29	688	930	1,199	9,438	14,988	14,614
New England	0	0	0	30	26	26	670	735	945
Middle Atlantic	0	0	0	45	82	122	1,257	2,614	3,124
East North Central	4	9	10	73	197	136	2,274	4,167	4,167
West North Central	9	3	9	34	47	62	609	1,195	760
South Atlantic	4	0	1	180	186	204	2,195	2,596	1,891
East South Central	1	1	2	119	154	185	519	547	547
West South Central	1	3	3	160	171	264	902	1,214	1,037
Mountain	1	7	7	14	44	45	584	693	582
Pacific	1	0	1	33	23	46	428	1,227	1,227

[1] Mississippi and New York excluded, New York City included.

[2] Mississippi excluded.

August 12. For the country as a whole the incidence was almost 2 times that reported for the corresponding period in 1943 and more than 4 times the 1939–43 median. Nine states reported more than 75 percent of the total infantile paralysis cases, viz., New York, 1,057 cases; Pennsylvania, 278; Kentucky, 208; North Carolina, 220; Virginia, 167; Ohio, 157; Michigan, 147; Indiana, 99; and Maryland, 80 cases. In some States only the normal seasonal increase occurred, and in many others the reports were not greatly above the usual expectancy. So far every section of the country except the Mountain and Pacific regions has been affected by the current outbreak of this disease, with the largest excesses over the normal expectancy occurring in the Middle Atlantic, South Atlantic, and East South Central regions. In 1943 the first increase in the number of cases occurred in States in the Mountain, Pacific, and West South Central sections, while in 1941 the disease first became epidemic in the South Atlantic and East South Central sections. Table 2 shows the reported cases in geographic areas

TABLE 2.—*Number of cases of poliomyelitis reported in each geographic area for recent weeks of 1944 with comparative data for 1943 and 1941* [1]

Division	Week ended—							
	July					August		
	1	8	15	22	29	5	12	19
All regions:								
1944	222	290	462	568	738	932	1 015	1,250
1943	190	245	297	329	361	450	545	747
1941	79	82	187	246	302	326	422	549
New England:								
1944	1	4	8	9	12	36	37	54
1943	0	1	6	3	11	32	36	62
1941	0	0	2	0	4	16	7	22
Middle Atlantic:								
1944	33	62	125	216	304	413	449	601
1943	5	6	14	12	13	20	38	46
1941	5	8	7	17	21	32	60	111
East North Central:								
1944	10	21	58	63	111	143	178	215
1943	1	8	4	12	21	46	79	144
1941	0	6	16	13	30	45	58	81
West North Central:								
1944	7	9	8	25	22	28	54	57
1943	5	9	15	12	40	61	117	118
1941	1	2	11	7	10	10	13	24
South Atlantic:								
1944	103	123	126	128	136	167	167	195
1943	2	1	6	9	7	5	8	7
1941	40	29	70	128	113	122	127	139
East South Central:								
1944	34	37	91	90	101	84	67	53
1943	0	6	5	6	14	11	5	29
1941	16	30	57	74	103	78	134	145
West South Central:								
1944	15	17	26	18	22	27	23	16
1943	107	137	148	148	141	122	119	104
1941	6	4	10	4	8	10	10	10
Mountain:								
1944	1	6	2	1	4	4	9	12
1943	10	2	9	11	4	29	23	43
1941	4	0	0	2	4	3	3	5
Pacific:								
1944	18	11	18	18	26	30	31	47
1943	60	75	90	116	110	124	120	194
1941	7	3	14	1	9	10	10	12

[1] A similar table for earlier reports appeared in Public Health Reports for Aug. 4, 1944, p. 1024.

during recent weeks of 1944 with corresponding data for 1943 and 1941. In 1942 the number of cases of poliomyelitis was the lowest reported in recent years. For the week ended August 19, 1944, the latest data available, there were 1,250 cases reported. Since the beginning of the year there have been 6,259 cases of poliomyelitis reported as compared with 4,058 for the same period in 1943, 1,505 in 1942, and 3,401 in 1941.

Scarlet fever.—For the country as a whole the incidence of scarlet fever remained at a relatively high level, 3,184 cases being reported for the current 4-week period, as compared with a 5-year median of 2,888 cases. The greatest excesses over the normal seasonal expectancy were reported from the South Atlantic and Pacific regions with minor excesses in the East North Central, West South Central, and Mountain sections; in other sections the incidence was either about normal or lower than the 1939–43 median.

Rocky Mountain spotted fever.—The South Atlantic region continued to report an unusually large number of cases of this disease, but in other sections the incidence was about normal. Of a total of 111 cases, the South Atlantic States reported 71, the Middle Atlantic and East South Central sections, 10 each, with the other sections reporting from none in the Pacific region to 5 each in the East North Central and West South Central sections. During the current period Virginia reported 23 cases, North Carolina 22, Maryland 12, and West Virginia and Georgia 6 each. Tennessee and New York reported 8 and 5 cases respectively, but no other State reported more than 3 cases for the 4-week period.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—The number of cases (6,201) of measles reported for the 4 weeks ended August 12 was only about one-half of the number reported for the corresponding period in 1943, and slightly more than 10 percent of the 1939–43 median. Increases over the seasonal expectancy were reported from the South Atlantic, West South Central, and Pacific regions, but very significant decreases were reported from the North Atlantic and East North Central regions, where the disease has been unusually prevalent for the past 2 years; minor decreases were reported from the West North Central, East South Central and Mountain sections.

Smallpox.—The smallpox situation was very favorable, 21 cases being reported for the current 4 weeks, as compared with 23 in 1943 and a 5-year median of 29 cases. Nine of the 21 cases occurred in the West North Central region, 4 each in the East North Central and South Atlantic regions; 4 other regions reported 1 case each, and none occurred in the North Atlantic region.

Typhoid and paratyphoid fever.—The incidence of this disease was also relatively low, the number of cases (688) being about 75 percent of the number reported in 1943 and less than 60 percent of the preceding 5-year median. With one exception, the New England region, the incidence was considerably below the normal seasonal incidence in all sections of the country.

Whooping cough —The number of cases (9,438) of whooping cough reported was the lowest for the corresponding period in recent years. The preceding 5-year median for this period was approximately 14,600 cases The number of cases occurring in the South Atlantic section was about 20 percent above the seasonal expectancy, and in the West North Central, East South Central, and Mountain sections the numbers of cases were about normal, but in each of the other 5 sections the incidence was the lowest in the 7 years for which these data are available

MORTALITY, ALL CAUSES

For the 4 weeks ended August 12, there were 32,044 deaths from all causes reported to the Bureau of the Census by 93 large cities The average number of deaths reported for the corresponding weeks in the 3 preceding years was 31,787 For the first two weeks of the period the number of deaths was below the preceding 3-year average, during the third week the number of deaths was about 4 percent above the average, and for the last week the number reported was approximately the same as the average Cities in the North Atlantic, South Central, Mountain, and Pacific regions reported slight increases over the 3-year average, while those in the South Atlantic and North Central sections reported fewer deaths

DEATHS DURING WEEK ENDED AUGUST 19, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug 19, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8 657	7 747
Average for 3 prior years	7 494	
Total deaths, first 33 weeks of year	304 903	310 705
Deaths under 1 year of age	665	661
Average for 3 prior years	574	
Deaths under 1 year of age first 33 weeks of year	20 474	22 219
Data from industrial insurance companies		
Policies in force	66 699 037	65 741 955
Number of death claims	11 555	10,573
Death claims per 1,000 policies in force annual rate	9 1	8 4
Death claims per 1,000 policies, first 33 weeks of year, annual rate	10 2	10 0

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PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 26, 1944

Summary

A total of 1,529 cases of poliomyelitis was reported as compared with 1,254 last week, 1,014 for the next earlier week and 872 for the corresponding week last year. The current figure is the largest number of cases reported for a corresponding week since 1927, the earliest year for which weekly reports are available, and probably the largest since 1916. Increases occurred in all of the nine geographic areas except the West South Central and the Pacific. The largest numbers were reported in the Middle Atlantic, North Central, and South Atlantic areas, aggregating 1,345 cases, or 88 percent of the total. In these sections, the smallest numerical increase occurred in the South Atlantic area.

Fifteen States reported 19 or more cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 43 (30), Connecticut 19 (15), New York 581 (469), New Jersey 36 (24), Pennsylvania 139 (108), Ohio 97 (92), Illinois 38 (34), Michigan 94 (55), Wisconsin 26 (11), Minnesota 57 (38), Maryland 40 (27), District of Columbia 27 (19), Kentucky 38 (35); *decreases*—Virginia 63 (66), North Carolina 46 (48).

The cumulative total for the year to date is 7,789, as compared with 4,930 and 6,398, respectively, for the corresponding periods last year and in 1931. The cumulative total to date this year is apparently the largest number reported for the period since the epidemic of 1916.

The incidence of meningococcus meningitis continues high. To date a total of 13,248 cases has been reported, as compared with 13,694 for the same period last year, and a 5-year (1939–43) median of 1,441 cases. The largest numbers of cases are being reported in the Middle Atlantic and East North Central areas.

With the exception of poliomyelitis and meningitis the incidence of the important communicable diseases is at about normal expectancy. Endemic typhus fever is somewhat above last year's figures—a total of 2,934 cases has been reported to date as compared with 2,341 for the same period last year. The highest incidence is being reported in Georgia, Texas, Alabama, and North Carolina. For the current week cases were reported in only 11 States, all in the South Atlantic and South Central areas.

The number of deaths in 93 large cities dropped sharply during the week—from 8,681 to 7,472. This latter figure is below the 3-year (1941–43) median of 7,509.

Telegraphic morbidity reports from State health officers for the week ended August 26, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended— Aug 26 1944	Week ended— Aug 28 1943	Median 1939–43	Week ended— Aug 26 1944	Week ended— Aug 28 1943	Median 1939–43	Week ended— Aug 26 1944	Week ended— Aug 28 1943	Median 1939–43	Week ended— Aug 26 1944	Week ended— Aug 28 1943	Median 1939–43
NEW ENGLAND												
Maine	0	0	0	2			5	2	6	0	2	0
New Hampshire	0	0	0				2	4	0	0	0	0
Vermont	0	0	0				5	3	12	0	0	0
Massachusetts	1	2	2				40	55	55	4	13	2
Rhode Island	1	0	0		1		0	10	10	0	2	0
Connecticut	0	2	0				15	11	9	2	8	0
MIDDLE ATLANTIC												
New York	5	8	8	(1)	(1)	1 1	51	137	90	31	25	3
New Jersey	0	0	1	2	1	2	21	76	36	7	6	1
Pennsylvania	6	6	6	3	2		22	24	28	11	18	4
EAST NORTH CENTRAL												
Ohio	9	6	6	3	3	3	5	50	18	5	8	1
Indiana	3	8	4	4	5	4	4	7	3	3	5	1
Illinois	3	5	9	[illegible]		2	14	28	24	13	8	2
Michigan[2]	8	5	5	1		1	32	232	35	4	7	1
Wisconsin	6	2	2	10	13	11	51	114	76	4	5	1
WEST NORTH CENTRAL												
Minnesota	2	9	3		1	1	6	26	6	2	0	0
Iowa	0	4	4				3	5	5	3	3	0
Missouri	2	1	5	2	1	1	4	9	7	10	5	2
North Dakota	0	1	1				1	6	1	0	0	0
South Dakota	0	2	4				1	11	2	0	0	0
Nebraska	1	4	1	[illegible]	2		1	7	1	1	0	0
Kansas	1	9	3		3	2	11	19	11	1	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	0			1	0	0	0	1	0
Maryland[2]	3	3	1	1	1	3	4	6	4	1	2	2
District of Columbia	0	0	1				1	6	2	[illegible]	0	0
Virginia	8	10	10	[illegible]	59	58	5	23	22	1	6	1
West Virginia	4	2	2			6	1	8	1	0	2	1
North Carolina	16	18	18		2		20	17	6	2	7	0
South Carolina	11	11	11	86	12	[illegible]	10	14	14	3	1	0
Georgia	7	16	11	7	9	1	3	7	2	3	1	0
Florida	12	1	2	1	11	3	72	2	2	1	1	0
EAST SOUTH CENTRAL												
Kentucky	7	4	6	2			2	14	6	1	0	0
Tennessee	6	3	6	3	8	8	4	5	7	6	1	1
Alabama	31	16	14	2	4	6	7	[illegible]	16	10	1	1
Mississippi[2]	5	2	5				0			3	0	0
WEST SOUTH CENTRAL												
Arkansas	5	7	8	10	2	2	6	8	8	0	0	0
Louisiana	5	1	5		1	2	0	3	1	2	[illegible]	0
Oklahoma	1	[illegible]	3		5	10	0	5	4	0	1	0
Texas	18	21	18	[illegible]	250	128	33	41	33	8	2	1
MOUNTAIN												
Montana	0	1	1	10			1	22	6	0	0	0
Idaho	0	1	0				0	0	0	0	1	0
Wyoming	0	0	0				0	2		0	0	0
Colorado	9	2	7	2	[illegible]	[illegible]	1	9	8	1	1	0
New Mexico	7	0	1	1			1	2	2	0	0	0
Arizona	1	0	1	19	39	[illegible]	8	11	11	1	1	0
Utah[2]	0	0	0	1			5	[illegible]	6	0	1	1
Nevada	0	0	0				0	3	0	0	1	0
PACIFIC												
Washington	0	9	1	2			19	32	26	6	4	0
Oregon	2	[illegible]	3	1	1	3	46	7	9	2	0	0
California	18	22	8	7	23	13	149	103	74	7	15	1
Total	224	233	218	500	581	472	696	1,207	879	159	166	29
34 weeks	6 984	7 498	7 831	339 178	82 248	152 006	591 654	538,338	467,273	13,248	13,694	1 441

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended August 26, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Aug. 26, 1944	Aug. 28, 1943		Aug. 26, 1944	Aug. 28, 1943		Aug. 26, 1944	Aug. 28, 1943		Aug. 26, 1944	Aug. 28, 1943	
NEW ENGLAND												
Maine	2	2	1	4	6	2	0	0	0	2	0	0
New Hampshire	8	0	0	2	8	0	0	0	0	0	0	0
Vermont	2	1	0	0	1	1	0	0	0	0	2	0
Massachusetts	43	8	4	41	66	35	0	0	0	8	6	4
Rhode Island	0	12	1	2	2	2	0	0	0	0	0	0
Connecticut	19	39	3	10	5	5	0	0	0	0	3	3
MIDDLE ATLANTIC												
New York	581	42	42	37	54	54	0	0	0	15	9	14
New Jersey	36	6	20	8	14	15	0	0	0	0	2	7
Pennsylvania	139	9	9	30	32	30	0	0	0	11	11	15
EAST NORTH CENTRAL												
Ohio	97	11	11	51	66	48	0	0	0	7	10	10
Indiana	16	19	7	9	9	11	0	0	0	1	2	2
Illinois	38	194	23	32	25	38	0	0	0	4	4	12
Michigan [2]	94	9	11	30	24	27	0	0	0	3	4	4
Wisconsin	26	8	6	23	20	32	0	0	0	1	1	0
WEST NORTH CENTRAL												
Minnesota	57	10	10	20	14	14	0	0	0	0	0	0
Iowa	15	13	7	14	4	9	0	0	0	3	0	3
Missouri	10	24	[illegible]	8	17	14	0	0	0	7	13	13
North Dakota	7	1	2	0	2	1	0	0	0	0	6	1
South Dakota	0	0	0	2	3	2	0	0	0	0	0	0
Nebraska	9	17	7	1	6	5	1	0	0	0	0	1
Kansas	6	66	2	9	21	19	0	0	0	4	5	5
SOUTH ATLANTIC												
Delaware	5	0	0	3	2	2	0	0	0	1	0	0
Maryland [2]	40	1	1	9	12	7	0	0	0	3	2	6
District of Columbia	27	0	1	2	3	4	0	0	0	2	0	1
Virginia	63	1	1	18	19	12	0	0	0	4	8	10
West Virginia	17	4	4	24	19	20	0	0	0	5	12	6
North Carolina	46	1	4	30	30	22	0	0	0	3	10	10
South Carolina	5	2	4	4	10	5	0	0	0	3	4	6
Georgia	7	1	1	7	15	8	0	0	0	8	15	19
Florida	4	0	2	3	5	3	0	0	0	2	3	3
EAST SOUTH CENTRAL												
Kentucky	38	16	16	6	21	21	0	0	0	8	8	15
Tennessee	9	0	2	15	17	14	0	0	0	5	6	15
Alabama	7	3	3	13	18	18	1	0	0	6	4	13
Mississippi [2]	2	1	2	6	8	5	1	0	0	2	6	11
WEST SOUTH CENTRAL												
Arkansas	1	4	1	6	3	3	0	0	0	3	5	13
Louisiana	2	2	2	5	3	3	0	0	0	7	5	9
Oklahoma	1	36	1	3	3	5	0	0	0	10	12	12
Texas	7	75	10	21	19	18	0	0	0	30	14	28
MOUNTAIN												
Montana	2	0	0	9	8	8	0	0	0	0	0	1
Idaho	0	0	0	7	53	1	0	0	0	2	0	1
Wyoming	2	1	0	4	2	2	0	0	0	0	0	0
Colorado	7	21	2	3	18	7	0	0	0	2	0	1
New Mexico	2	4	2	3	0	2	0	0	0	5	0	3
Arizona	0	8	1	2	4	1	0	0	0	4	2	1
Utah [2]	3	13	3	11	2	2	0	0	0	1	0	2
Nevada	0	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	5	25	1	26	10	7	0	0	0	1	0	0
Oregon	12	24	1	14	11	5	0	0	0	3	0	2
California	10	138	16	60	52	44	0	0	0	4	6	6
Total	1,529	772	617	647	767	588	3	0	3	190	200	303
34 weeks	[4] 7,789	4,930	2,695	148,239	98,496	98,496	303	609	1,190	[4] 3,447	3,486	4,836

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: Massachusetts 7, New York 6, Ohio 1, Illinois 1, Virginia 1, Tennessee 1, Louisiana 1, Texas 2

[4] Cumulative totals changed by corrected reports

Telegraphic morbidity reports from State health officers for the week ended August 26, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Aug. 26, 1944	Whooping cough: Week ended— Aug. 28, 1943	Whooping cough: Median 1939-43	Week ended August 26, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	9	3	16	0	0	0	0	0	0	0	0	0
New Hampshire	3	3	0	0	0	0	0	0	0	0	0	0
Vermont	24	13	14	0	0	0	0	0	0	0	0	0
Massachusetts	43	94	116	0	0	3	0	1	0	0	0	0
Rhode Island	1	11	15	0	0	0	0	0	0	0	0	0
Connecticut	70	17	44	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	166	247	253	0	3	33	0	1	0	1	0	0
New Jersey	66	129	116	0	0	0	0	1	0	2	0	0
Pennsylvania	59	200	200	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	130	192	192	0	0	1	0	1	0	0	0	0
Indiana	3	36	30	0	0	0	0	1	0	1	0	0
Illinois	88	123	205	0	0	3	0	1	0	4	0	0
Michigan	107	245	215	0	0	10	0	0	0	0	0	0
Wisconsin [2]	110	232	208	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	39	44	44	0	3	0	0	1	0	0	1	0
Iowa	1	47	22	0	0	0	0	2	0	0	0	0
Missouri	26	20	20	0	0	0	1	0	0	0	0	0
North Dakota	12	27	21	0	0	0	0	8	0	0	0	0
South Dakota	7	6	3	0	0	0	0	0	0	0	0	0
Nebraska	3	24	4	0	0	0	0	0	0	0	0	
Kansas	34	47	45	0	0	0	0	1	0	0	0	
SOUTH ATLANTIC												
Delaware	3	5	1	0	0	0	0	0	0	0	0	0
Maryland [2]	61	82	56	0	0	0	4	1	0	0	0	0
District of Columbia	2	26	23	0	0	0	0	0	0	0	0	0
Virginia	39	82	57	0	0	0	183	0	0	5	1	2
West Virginia	13	37	13	0	0	0	0	0	0	0	0	0
North Carolina	117	111	107	0	0	2	0	0	0	[illegible]	0	21
South Carolina	31	101	25	0	1	20	0	0	0	0	0	7
Georgia	8	27	19	0	2	8	0	0	0	0	0	49
Florida	2	21	6	0	0	0	2	0	0	0	0	17
EAST SOUTH CENTRAL												
Kentucky	50	82	51	0	1	1	0	0	0	0	0	0
Tennessee	40	35	37	0	0	0	1	1	0	0	1	2
Alabama	15	14	21	0	3	0	0	0	0	0	0	38
Mississippi [2]	[3]0	-----	--------	0	0	0	0	0	0	0	1	7
WEST SOUTH CENTRAL												
Arkansas	15	35	7	0	0	37	0	0	0	0	1	1
Louisiana	11	8	8	0	1	5	0	0	0	0	0	13
Oklahoma	3	2	6	0	0	0	0	0	0	0	0	0
Texas	165	133	133	0	12	407	11	2	0	0	0	48
MOUNTAIN												
Montana	25	13	13	0	0	0	0	0	0	0	1	0
Idaho	17	5	5	0	0	0	0	0	0	0	0	0
Wyoming	5	4	1	0	0	0	0	2	0	0	1	0
Colorado	11	34	29	0	0	0	0	1	0	1	0	0
New Mexico	0	14	14	0	0	6	5	0	0	1	0	0
Arizona	70	13	13	0	0	0	33	0	0	0	0	0
Utah [2]	23	61	48	0	0	0	0	0	0	1	0	0
Nevada	0	2	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	11	64	23	0	0	0	0	0	0	0	0	0
Oregon	8	41	17	0	0	0	0	0	0	0	0	0
California	60	165	165	0	1	13	0	4	0	0	0	0
Total	1,806	2,977	2,965	0	27	549	240	29	0	16	7	205
Same week 1943	------	-----	--------	1	54	394	352	22	0	16	19	139
Same week 1942	------	-----	--------	1	23	248	224	19	0	11	18	153
34 weeks 1944	64,958	-----	--------	30	1,138	14,543	5,424	401	20	381	386	2,934
34 weeks 1943	134,893	-----	--------	42	1,405	10,649	4,978	450	18	364	609	2,341
34 weeks 1942	------	-----	[5]129,238	58	740	5,842	4,539	340	35	[5]389	668	[5]1,641

[2] Period ended earlier than Saturday. [5] 5-year median, 1939-43.

NOTIFIABLE DISEASES, SECOND QUARTER 1944[1]

The figures in the following table are the totals of the monthly morbidity reports received from the State health authorities for April, May, and June 1944. These reports are preliminary and the figures are therefore more or less incomplete. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but owing to population shifts and the presence of large military populations in certain States, the figures for some States are not comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State. The lists of diseases required to be reported are not the same for each State. Only 12 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported, and the figures are included although manifestly incomplete. There are also variations among the States in the degree of completeness of reporting of cases of the reportable diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating a trend by providing a comparison with similar preliminary figures for prior years. To some extent they also give a picture of the geographic prevalence of certain diseases, as the States are arranged by geographic location.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for April, May, and June 1944

Division and State	Anthrax	Chickenpox	*Conjunctivitis [2]	*Diphtheria	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria	*Measles	*Meningitis, meningococcus	Mumps	Ophthalmia neonatorum	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine		1,289		3				2	157		76		3,476	26	65			280
New Hampshire		188		2				2	59		5	1	336	10	133			10
Vermont		749		1					211		3		1,020	1	359			5
Massachusetts	1	7,100	131	48	1	38		6	974			209	10,718	136	3,887	50		839
Rhode Island		480	14	9		13			45		216	24	1,706	21	80	1		84
Connecticut		2,192	11	6	1	5		4	525		9	12	5,679	73	829			725
MIDDLE ATLANTIC																		
New York	1	8,955		84	13	119		15	668		[3] 30	[4] 136	19,032	524	2,375	23		5,413
New Jersey	2	7,714		34	11			4	1,926		39	172	13,225	180	5,461	1		965
Pennsylvania	5	10,121		123	8	2		2			31		9,665	380	7,959	7		1,100
EAST NORTH CENTRAL																		
Ohio		3,991	4	47	11			11	359	1	133	56	7,528	297	903	167		1,015
Indiana		1,149	3	54	2		28	2	96	1	65	51	2,065	89	737	1		122
Illinois		6,465	6	75	8	57		15	1,541	1	223	3	7,991	349	2,701	138	1	2,002
Michigan		7,993	119	73	6	21		5	900		21	32	9,104	270	3,792	9		646
Wisconsin		10,416		39	6			8	901		328	10	25,925	87	4,162			387

WEST NORTH CENTRAL																		
Minnesota		1,706		73	26	3	1	1			11	19	6,844	69				57
Iowa		624		33				1	67		53	23	2,136	34	937			93
Missouri		401	4	20		2	7	4			21	37	2,906	222	484	2		461
North Dakota		86	4	9				1			99		675	12	6			287
South Dakota		209		13									232	8	262			30
Nebraska		289		23							19		1,648	13	1,121			32
Kansas		801	7	29	3	1		2	280		20	24	4,446	56	1,622		1	213
SOUTH ATLANTIC																		
Delaware		23		4	1								158	16	92			7
Maryland		1,695	25	89	3	3	11		176		32	5	5,416	102	1,458	2		606
District of Columbia		715		1							12	35	1,804	22	291			163
Virginia		1,227		53			1,063	1			1,504	174	8,077	130	725		11	844
West Virginia		440		32			2				85	2	4,419	45	141			62
North Carolina		1,099		85	4						99	50	11,330	100			4	146
South Carolina		707		154	4	220			574	199	2,689	2,745	4,219	56	1,198	1	191	1,092
Georgia		226	56	35	19	86	6			792	148	84	1,752	48	1,245		15	215
Florida		644	6	34	14	477	3	9	175	1,897	172	90	2,721	76	720	4	2	391
EAST SOUTH CENTRAL																		
Kentucky		303		25	1	40		1			271	3	1,250	83	674			335
Tennessee		476		39	4	14	5	2	148	1	352	34	2,057	143	654	5	21	605
Alabama		294		54	10			6	129		582	530	3,347	101	1,265		6	977
Mississippi		2,067		49	306	3,874				1,153	6,467	6,781	6,658	63	3,071	14	813	2,820
WEST SOUTH CENTRAL																		
Arkansas		258		38	12	83			181	4	513	384	2,368	37	299		10	307
Louisiana		135		46	18	57			54	66	118	305	1,160	87	435	41	5	682
Oklahoma		367		37	6	26	5	1		6	821	356	3,335	30	238		8	424
Texas		4,090		338	156	4,404		22			[illegible],201	1,657	32,442	202	2,056	13	365	2,367
MOUNTAIN																		
Montana		445	33	12		1		[6] 1	337		64	8	1,106	7	525			92
Idaho		170	11	1				1	386		4		444	6	111			11
Wyoming		133	4	4	3			1	122		14	7	1,003	13	345			22
Colorado		1,347		71	3	8					260	17	2,631	32	1,423			431
New Mexico		176		24	2	10	3	1	130		39	3	1,259	5	172		3	238
Arizona		329		23	3	1	587	1	118		564	9	2,035	7	296	1	2	519
Utah	1	1,115		1	2		3		372		85	21	599	10	1,076			87
Nevada		323		12	1			2			201	4	338	3	314			32
PACIFIC																		
Washington [8]		2,494	11	41			2	6	829		41	1	2,842	55	1,762			405
Oregon		725		34	[7] 7						156	2	1,477	20	806			266
California		13,101	10	306	20	111		15	8,663		444	424	46,815	350	14,108			875
Total	10	108,042	459	2,440	[7] 697	9,676	[7] 726	155	21,103	4,121	23,340	14,540	289,419	4,706	73,375	480	1,458	29,787
Second quarter 1943	16	96,805	364	2,522	935	8,354	[illegible],045	168	200,004	3,154	29,370	14,806	314,283	6,407	83,139	459	1,475	35,506
Median, 1939–43	18	90,297		2,844	899	7,633	505	168		6,657	29,370	16,242	265,669	559	77,268	437	2,534	35,304
Alaska		102				61			4		19		62	1	55			12
Hawaii Territory		574	23	7	17	141			87	29	191	[8] 80	772	23	1,205			22
Panama Canal Zone [9]		56		12	4	10						351	72	4	27			[10] 104

See footnotes on page 1154.

Consolidated monthly State morbidity reports for April, May, and June 1944—Continued

Division and State	*Poliomyelitis	Rabies in animals	Rabies in man	Rocky Mountain spotted fever	*Scarlet fever	Septic sore throat	*Smallpox	Tetanus	Trachoma	Trichinosis	*Tuberculosis, all forms	Tuberculosis, respiratory	Tularemia	*Typhoid and paratyphoid fever	Paratyphoid fever	Typhus fever	*Undulant fever	Vincent's infection	*Whooping cough
NEW ENGLAND																			
Maine		1			579	5					174	154		9			7	21	168
New Hampshire	2				75	6					91			1				2	11
Vermont	2				101	.					29			2			34	8	145
Massachusetts	3				4,154	55		3		7	820	768		42	33		15		884
Rhode Island	2				174	15		1		2	202	199		6	3		3	1	147
Connecticut	3				937	40		3		2	344	325		7	3		11		398
MIDDLE ATLANTIC																			
New York	46	93		8	5,676	199		7		51	3,917	3,654		48	8	6	65		1,622
New Jersey	6		1	9	2,565	20		2	1	7	952			18	2		18		581
Pennsylvania	11		1	4	6,888					2	1,369		2	44		1	24		987
EAST NORTH CENTRAL																			
Ohio	22	183			5,696	9	2	1	5	4	1,775	1,706		31	5		22	15	958
Indiana	3				1,748	26	10	1	1		922	911		18			20	68	169
Illinois	15	125	2	3	4,156	70	7	2	69	1	2,242	2,056	1	30	4		90	63	472
Michigan	4	45			3,382	233	1	7		1	1,812			27	4		27	42	921
Wisconsin	4				3,530	26	9		6		702			6			70		706
WEST NORTH CENTRAL																			
Minnesota	14				1,653	17					604		4	9	1		98	4	210
Iowa		13		1	1,773	1	12				360	270		5			54	1	107
Missouri	1	9	3	1	1,427	14	1	4	225		655			22			16	1	220
North Dakota				2	363	2	1		6		51	46					1	16	41
South Dakota				1	278		2		11		120						3		71
Nebraska	1				603						52			1			1		145
Kansas	8	8			793	6	3	1	20	1	228	205	2	15	3		60	31	495
SOUTH ATLANTIC																			
Delaware				3	134						56	56							5
Maryland	2	27		35	1,912	39		1			979	952		19			9	5	562
District of Columbia		67			1,161						526	505		3			1		38
Virginia	12			20	933	371					1,033	1,033	11	35	2	2	15		857
West Virginia	1			2	1,028	7	2				438		1	49	11		1		297

North Carolina	124			21	352	6					516	506	4	32		21			1,817
South Carolina	12	42		1	67	98	2	4			173		3	35	7	12	2		1 134
Georgia	3			2	273	61		4	1	2	635	634	18	55	8	151	43	53	231
Florida	22				85	7		10	1		288	284	1	24	8	75	8	163	336
EAST SOUTH CENTRAL																			
Kentucky	58			4	720	12	5				758	721	1	44	2		5		910
Tennessee	4		1	2	760	35	2	5		1	1 277		6	37	3	4	15	70	341
Alabama	13	61			123		3	10			788		5	19	1	98	30		329
Mississippi	17				54		5		19		439	411	36	16		32	17		4,417
WEST SOUTH CENTRAL																			
Arkansas	8	59	1		78	151	1	1	148		252	194	30	27	6	3	4		191
Louisiana	54	53		1	64	110	7	8			441	439	6	64	5	42	12		87
Oklahoma	6		1		235	37	3		68		535		2	30			17		152
Texas	37				1 254	116	6		48		4 616		10	104	7	373	140		3 099
MOUNTAIN																			
Montana	2			4	402	16	6		2		159	46	3	5			4		62
Idaho				3	391	2		1	2		8	8	2	4					55
Wyoming				22	187	24			43		21	3	4	2			2	7	180
Colorado	6			7	627	10	2				462		1	12	1		18		444
New Mexico		15			163	6			4		253	242		18	1				71
Arizona	6				249	3	1		131		281			17	1		8		194
Utah	1	9		3	768						38	34	5				5		724
Nevada				1	27	30					21			4			1	20	60
PACIFIC																			
Washington [8]	8				2 470	64	2	1			517	338		7	2		14	16	291
Oregon	6	1		2	1 206	12			23		204			12	1			35	136
California	79	280			3 582		5	12	11	13	2 526	2 387	1	134	8	3	98		1 368
Total	628	1 091	10	162	65 856	1 961	100	89	845	94	35 661	19 087	159	1 149	140	823	1 108	642	27 806
Second quarter 1943	680	728	10	168	43 121	2 886	245	112	571	60	33 157	18 804	280	1 056	204	613	958	873	60 568
Median 1939–43	416	728	10	192	42 261	2 952	524	110	699	95	28 024	15 301	241	1 041		464	938	484	51 886
Alaska	3				6		1				107	105						2	16
Hawaii Territory					29	11		7			179	164		2	1	26	2		66
Panama Canal Zone [9]											[10] 18	[10] 10		4	3				[10] 16

See footnotes on page 1154

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States, paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table.

[1] For reports for first quarter of 1944, see page 816 of the PUBLIC HEALTH REPORTS of June 23, 1944.

[2] Includes cases of suppurative and kerato conjunctivitis and of pink eye.

[3] New York City only.

[4] Includes 75 cases with infection outside New York State.

[5] No monthly report for June for Washington has been received, the figures included for June are for the 4 weeks ended July 1.

[6] Equine encephalitis.

[7] Exclusive of 39 cases among prisoners of war.

[8] Cases reported off-shipping.

[9] Includes the cities of Colon and Panama.

[10] In the Canal Zone only.

Actinomycosis: Illinois 1, Michigan 1, Minnesota 12, Kansas 2.

Botulism: Illinois 1, California 1.

Coccidioidomycosis: Arizona 19, California 11.

Dengue: South Carolina 2, Kentucky 2, Alabama 1, Louisiana 3, Texas 16, Hawaii Territory 41.

Diarrhea and enteritis: Rhode Island 5 (diarrhea only), New Jersey 33 (diarrhea only), Ohio 71, Indiana 1 (diarrhea only), Illinois 1 (diarrhea only), Michigan 11 (diarrhea only), Maryland 9 (diarrhea only), South Carolina 4,225 (diarrhea only), Florida 8 (diarrhea only), New Mexico 18, Nevada 18 (diarrhea only), Washington 6, California 3.

Dog bite: Illinois 3,770 (all animals), Michigan 2,614, Arkansas 53.

Filariasis: South Carolina 2.

Food poisoning: Louisiana 1, New Mexico 1, Washington 1, California 176.

Granuloma inguinale: Missouri 15, Florida 59, Tennessee 14, Mississippi 130, Louisiana 38, Arizona 5, Washington 12.

Impetigo contagiosa: Ohio 1, Indiana 2, Illinois 25, Michigan 193, Missouri 2, North Dakota 3, South Dakota 3, Kansas 13, Maryland 3, Montana 5, Wyoming 4, Oregon 53, Alaska 4, Hawaii Territory 30.

Jaundice: Indiana 1, Illinois 1, Minnesota 1, Maryland 6, Florida 10, Wyoming 3, Washington 9, California 94, Alaska 2.

Lead poisoning: Minnesota 1.

Leprosy: New York 1, New Jersey 1, Maryland 1, Florida 1, Texas 1, California 3, Hawaii Territory 7.

Lymphocytic choriomeningitis: Illinois 1, Tennessee 1.

Lymphogranuloma venereum: Missouri 12, Florida 82, Tennessee 25, Louisiana 26, Arizona 12, Utah 1, Nevada 2.

Plague, pneumonic: California 1 (laboratory infection).

Psittacosis: Pennsylvania 2, Utah 1.

Puerperal septicemia: Georgia 1, Florida 2, Tennessee 1, Mississippi 58, Louisiana 1, New Mexico 2, Nevada 1.

Relapsing fever: Texas 5, New Mexico 1.

Rheumatic fever: Indiana 3, Illinois 142, Michigan 59, Missouri 46, North Dakota 3, Maryland 148, Georgia 12, Utah 69, Washington 70, California 365.

Scabies: Ohio 2, Michigan 187, Missouri 2, North Dakota 15, Kansas 15, Montana 5, Idaho 1, Wyoming 25, Oregon 91, Alaska 2.

Silicosis: Ohio 1, Utah 1.

Weil's disease: Michigan 26, Utah 1, Hawaii Territory 3.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 12, 1944

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0	-	0	0	0	1	0	2	0	0	2
New Hampshire												
Concord	0	0		0	0	0	3	0	0	0	0	0
Massachusetts												
Boston	0	0		0	20	6	14	2	7	0	0	23
Fall River	0	0		0	0	0	0	0	0	0	0	3
Springfield	0	0		0	0	0	0	0	6	0	0	3
Worcester	0	0		0	0	0	2	0	1	0	0	5
Rhode Island												
Providence	0	0		0	2	0	1	1	0	0	1	1
Connecticut												
Bridgeport	0	0		0	0	0	2	2	0	0	0	2
Hartford	1	0		0	1	1	0	2	1	0	0	0
New Haven	0	0		0	0	0	0	0	0	0	0	10
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		1	0	0	6	74	1	0	0	1
New York	5	1	1	1	18	14	58	108	18	0	3	87
Rochester	0	0		0	9	0	3	8	2	0	0	6
Syracuse	0	0		0	2	0	1	7	2	0	0	10
New Jersey												
Camden	0	0		0	0	1	2	0	0	0	0	0
Newark	0	0		0	6	0	3	2	2	0	0	3
Trenton	0	0		0	0	0	3	0	0	0	0	0
Pennsylvania												
Philadelphia	0	0		0	2	4	14	29	7	0	0	9
Pittsburgh	0	0	1	0	0	5	4	9	3	0	0	8
Reading	0	0		0	0	0	0	0	0	0	0	1
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		0	0	3	2	10	4	0	0	15
Cleveland	0	0	3	0	4	2	6	13	13	0	0	14
Columbus	0	0		0	0	0	0	2	1	0	1	8
Indiana												
Fort Wayne	0	0		0	0	0	4	1	0	0	0	0
Indianapolis	4	0		1	1	1	5	2	0	0	0	15
South Bend	0	0		0	0	0	0	1	0	0	0	2
Terre Haute	0	0		0	0	0	3	0	0	0	0	3
Illinois												
Chicago	0	0		0	11	6	19	12	12	0	1	73
Springfield	0	0		0	0	0	0	0	2	0	0	1
Michigan												
Detroit	7	0	1	0	10	1	5	28	13	0	1	48
Flint	0	0		0	0	0	1	0	0	0	2	0
Grand Rapids	0	0		0	0	1	2	0	2	0	0	8
Wisconsin												
Kenosha	0	0		0	0	0	0	0	0	0	0	33
Milwaukee	0	0		0	17	2	1	2	6	0	0	29
Racine	0	0		0	6	1	1	0	1	0	0	8
Superior	0	0		0	7	0	0	0	2	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Minneapolis	3	0	-	0	4	0	1	10	3	0	1	2
St Paul	0	0	-	0	1	0	5	5	1	0	0	22
Missouri												
Kansas City	0	0		0	0	0	10	1	1	0	0	1
St. Joseph	0	0	--	0	0	0	0	0	1	0	0	1
St Louis	0	0	--	0	26	5	7	1	0	0	1	10
North Dakota												
Fargo	0	0	-	0	0	0	0	0	0	0	0	0
Nebraska												
Omaha	0	0	-----	1	0	0	1	2	0	0	0	0

City reports for week ended Aug. 12, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST SOUTH CENTRAL—continued												
Kansas:												
Topeka	0	0	------	0	3	0	0	0	3	0	0	7
Wichita	0	0	------	0	0	0	8	1	0	0	0	6
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	2	4	0	0	0	4
Maryland:												
Baltimore	0	0	------	0	0	3	8	7	6	0	1	91
Cumberland	0	0	------	0	0	0	1	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	1	0
District of Columbia:												
Washington	0	0	1	0	6	1	1	10	4	0	0	1
Virginia:												
Lynchburg	0	0	------	0	1	0	0	9	0	0	1	0
Richmond	0	0	------	0	0	1	2	3	3	0	0	1
Roanoke	0	0	------	0	0	0	0	2	0	0	0	3
West Virginia:												
Charleston	1	0	------	0	0	0	0	0	0	0	0	0
Wheeling	0	0	------	0	1	0	0	1	2	0	0	5
North Carolina:												
Raleigh	0	0		0	0	0	0	1	0	0	0	0
Wilmington	0	0	------	0	1	0	0	2	1	0	0	14
Winston-Salem	0	0	------	0	0	0	0	3	2	0	0	3
South Carolina:												
Charleston	0	0		0	0	0	0	4	0	0	0	0
Georgia:												
Atlanta	0	0		0	0	0	0	0	0	0	1	1
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	0	0	1	1
Florida:												
Tampa	0	0	------	0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	1	3	0	0	0	0	12
Nashville	0	0	------	0	0	0	2	0	0	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	1	2	2	1	0	0	0
Mobile	0	0	------	0	0	0	0	1	2	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	0	0	0	0	0	4
Louisiana:												
New Orleans	0	0	1	1	2	0	8	11	1	0	0	0
Shreveport	0	0	------	0	0	0	4	0	1	0	0	0
Texas:												
Dallas	0	0	------	0	0	0	4	2	2	0	0	7
Galveston	0	0	------	0	0	0	1	0	0	0	0	1
Houston	0	0	------	0	2	1	3	0	2	0	1	0
San Antonio	0	0	1	1	0	0	1	0	0	0	1	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	0	0	0	0	5
Great Falls	0	0	------	0	1	0	0	0	0	0	0	7
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	2	0	2	0	1	0	5	1	3	0	0	11
Pueblo	0	0	------	0	0	0	2	0	0	0	0	2
Utah:												
Salt Lake City	0	0	------	0	4	0	0	0	1	0	0	11

City reports for week ended Aug. 12, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington												
Seattle	0	0		1	5	0	0	0	3	0	0	[illegible]
Spokane	0	0		0	1	0	3	3	1	0	0	[illegible]
Tacoma	0	0		0	2	0	0	0	1	0	0	
California												
Los Angeles	4	0	1	0	28	4	3	4	11	0	0	[illegible]
Sacramento	3	0		0	6	0	1	0	0	0	0	[illegible]
San Francisco	0	0		0	75	2	4	0	9	0	0	[illegible]
Total	30	1	12	7	286	67	261	405	173	0	18	68[illegible]
Corresponding week 1943	35		17	6	438		243		172	0	30	1 20[illegible]
Average 1939–43	44		27	[1] 10	[1] 362		[2] 230		189	1	43	1 18[illegible]

[1] 3 year average 1941–43
[2] 5-year median

Anthrax—Cases Rochester 1 Philadelphia 1
Dysentery amebic—Cases Boston 1 New York 1 Cleveland, 1, Chicago 1 Los Angeles 1, Sacramento, 1
Dysentery, bacillary—Cases Providence 1 New Haven 1 New York, 4 Chicago 3 Detroit 13 Charleston S C 10 Nashville 2 Houston 1 Los Angeles 9
Dysentery unspecified—Cases Columbus 1 Baltimore 1 Richmond 3 Shreveport 1
Rocky Mountain spotted fever—Cases New York 2 St Louis 1 Richmond 1
Typhus fever endemic—Cases New York 1 Wilmington N C 5 Atlanta 1 Savannah 5 Tampa 1 Birmingham 3 Mobile 5 New Orleans 1 Dallas 1 Houston 7 San Antonio 3

Rates (annual basis) per 100,000 population, by geographic groups for the 88 cities in the preceding table (estimated population, 1943, 34,295,100)

	Diphtheria case rates	Encephalitis infectious, case rates	Influenza		Measles case rates	Meningitis meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2 6	0 0	0 0	0 0	60	18 4	60 4	18 4	45	0 0	2 6	129
Middle Atlantic	2 3	0 5	0 9	0 9	17	11 1	43 5	109 7	16	0 0	1 4	58
East North Central	6 7	0 0	2 4	0 6	34	10 3	29 8	43 2	34	0 0	3 0	156
West North Central	6 2	0 0	0 0	2 1	70	10 3	65 9	41 2	19	0 0	4 1	101
South Atlantic	1 6	0 0	1 6	0 0	15	8 2	26 2	75 2	29	0 0	8 2	203
East South Central	0 0	0 0	0 0	0 0	0	11 8	41 3	17 7	18	0 0	0 0	71
West South Central	0 0	0 0	5 7	5 7	11	2 9	60 3	37 3	17	0 0	5 7	37
Mountain	15 9	0 0	15 9	0 0	48	0 0	63 5	7 9	32	0 0	0 0	286
Pacific	11 1	0 0	1 6	1 6	185	9 5	17 4	11 1	40	0 0	0 0	27
Total	4 6	0 2	1 8	1 1	44	10 2	39 8	61 7	26	0 0	2 7	104

PLAGUE INFECTION IN BIG HORN COUNTY, MONTANA

Plague infection has been proved in a pool of 50 fleas from 20 prairie dogs, *Cynomys ludovicianus*, collected on July 26 on a ranch 20 miles northeast of Hardin, Montana

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended August 12, 1944.—During the 4 weeks ended August 12, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	5	Ophthalmia neonatorum	4
Diphtheria	51	Poliomyelitis	1
Dysentery	10	Syphilis	496
Filariasis	1	Tetanus	13
Gonorrhea	365	Tetanus infantile	1
Influenza	45	Tuberculosis (all forms)	777
Leprosy	2	Typhoid fever	43
Malaria	570	Typhus fever (endemic)	34
Measles	17	Whooping cough	61

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 29, 1944[1]—During the week ended July 29, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		7	1	20	40	16	19	25	34	162
Diphtheria		4	1	27		10		1		43
Dysentery (bacillary)				10						10
German measles				3	11		5	1	14	34
Influenza					12		8		5	25
Measles		1	1	128	68	22	15	25	13	273
Meningitis, meningococcus		1			3		1			5
Mumps				10	34	5	4	15	12	80
Poliomyelitis			2	5	13	3				23
Scarlet fever		2	3	21	46	12	4	22	15	125
Tuberculosis (all forms)		1	4	141	45	20		12	36	259
Typhoid and paratyphoid fever			2	11	6			1	3	23
Undulant fever				11		1		1	1	14
Whooping cough		21		65	41	5	2	6	18	158

[1] No report has been received from Canada for the week ended July 22 1944

CUBA

Provinces—Notifiable diseases—4 weeks ended July 15, 1944—During the 4 weeks ended July 15, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			6	7		9	22
Cerebrospinal meningitis				1			1
Chickenpox	3					1	4
Diphtheria		40	2			1	43
Leprosy		1					1
Malaria	6	8	4	10	3	105	136
Measles	1	8	1	1		1	12
Poliomyelitis		10			2	1	13
Tuberculosis	23	6	11	34	8	33	115
Typhoid fever	14	74	16	83	32	55	274

[1] Includes the city of Habana

JAMAICA

Notifiable diseases—4 weeks ended July 29, 1944.—During the 4 weeks ended July 29, 1944, certain notifiable diseases were reported

in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		4	Puerperal sepsis		1
Chickenpox	6	30	Poliomyelitis		1
Diphtheria	6	5	Tuberculosis	25	64
Dysentery	4	5	Typhoid fever	14	45
Erysipelas	1	1	Typhus fever	4	------
Leprosy		5			

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above named diseases, except yellow fever, during the current year All reports of yellow fever are published currently

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month

(Few reports are available from the invaded countries of Europe and other nations in war zones)

Plague

Egypt.—Plague has been reported in Egypt as follows: Week ended July 29, 1944, Ismailiya, 1 case; Kasferid, 1 death; week ended August 5, 1944, Port Said, 4 cases, 2 deaths.

French West Africa—Dakar.—For the period April 20 to July 26, 1944, a total of 115 cases of plague with 99 deaths was reported in Dakar and its immediate suburbs. A total of 65 plague-infected rats and 2 plague-infected cats was also reported for the same period.

Indochina.—For the period July 1–20, 1944, 2 cases of plague were reported in Indochina.

Peru—Ancash Department.—For the month of June 1944, 10 cases of plague with 1 death were reported in Raquia area, Cajacay District, Ancash Department, Peru.

Senegal.—For the period July 1–10, 1944, 13 cases of plague with 6 deaths were reported in Senegal.

Smallpox

British East Africa—Tanganyika.—For the week ended July 15, 1944, 200 cases of smallpox were reported in Tanganyika, British East Africa.

French Guinea.—For the period July 1–10, 1944, 44 cases of smallpox with 5 deaths were reported in French Guinea.

Iran.—For the period April 1–May 12, 1944, 218 cases of smallpox were reported in Iran.

Union of South Africa.—For the period April 1–30, 1944, 112 cases of smallpox with 1 death were reported in the Union of South Africa.

Typhus Fever

Ecuador.—For the month of June 1944, a total of 38 cases of typhus fever with 4 deaths was reported in Ecuador, in localities, as follows: Carchi Province, 7 cases, 2 deaths; Loja, Loja Province, 1 case; Quito, 30 cases, 2 deaths.

Hungary.—For the week ended July 22, 1944, 61 cases of typhus fever (44 cases in Subcarpathia) were reported in Hungary.

Indochina.—For the period July 1–20, 1944, 29 cases of typhus fever were reported in Indochina.

Morocco (French).—For the month of June 1944, 402 cases of typhus fever were reported in French Morocco.

Trans-Jordan.—For the week ended July 1, 1944, 5 cases of typhus fever were reported in Trans-Jordan.

Union of South Africa.—For the month of April 1944, 854 cases of typhus fever with 185 deaths were reported in the Union of South Africa.

Yellow Fever

Gold Coast.—Yellow fever has been reported in Gold Coast as follows: Sekondi, August 4, 1944, 1 suspected case; Yendi, July 20, 1944, 1 suspected case.

Portuguese Guinea—Port Bintam.—On July 25, 1944, 1 case of yellow fever was reported in Farim District, Port Bintam, Portuguese Guinea.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G ST J PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world, (2) articles relating to the cause, prevention, and control of disease, (3) other pertinent information regarding sanitation and the conservation of the public health

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Public Health Reports

VOLUME 59 SEPTEMBER 8, 1944 NUMBER 36

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Physical Impairments in Low-Income Farm Families

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Public Health Reports

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PHYSICAL IMPAIRMENTS OF MEMBERS OF LOW-INCOME FARM FAMILIES—11,490 PERSONS IN 2,477 FARM SECURITY ADMINISTRATION BORROWER FAMILIES, 1940[1]

I. CHARACTERISTICS OF THE EXAMINED POPULATION. II. DEFECTIVE VISION AS DETERMINED BY THE SNELLEN TEST AND OTHER CHRONIC EYE CONDITIONS

By MARY GOVER, *Associate Statistician*, and JESSE B. YAUKEY,[1] *Statistician*, *United States Public Health Service*

During the past 9 years the Farm Security Administration has been engaged in the rehabilitation of low-income farmers who have insufficient collateral to obtain loans from banks. It was found in the course of the operation of this service that successful rehabilitation of these families in the field of farm operation required that attention also be given to their health and physical condition as well as to their more strictly occupational interests as farmers. To meet this need a health program has been developed under the direction of a medical officer of the Public Health Service who is loaned to the Farm Security Administration for this purpose. As a part of the activities of this program, in 1939-40, Dr. R. C. Williams, who was then in charge of the program, secured the physical examination of selected groups of the low-income farm families who were then participating in the program. The purpose of these examinations was to secure important information of value in planning the rehabilitation of these families and also to provide a source of data on the physical status of low-income farm families which would supplement the existing limited fund of information of this kind concerning the various social and economic groups that make up our population.

Available data dealing with the age-specific prevalence of physical impairments and chronic diseases among all members of selected groups of the population are limited, mainly, to two studies made from general physical examinations, namely, (1) examinations of 10,000

[1] From the Division of Public Health Methods, U. S. Public Health Service, in cooperation with the Farm Security Administration, Department of Agriculture. Mr. Yaukey is detailed to the Farm Security Administration.

male industrial workers in 10 surveyed industries (*3*); and (2) periodic examinations by the Life Extension Institute of 100,000 male and 12,000 female life insurance policyholders (*9*). Reports of the examinations of draftees and of youths employed or seeking employment on out-of-school work programs of the National Youth Administration are also available for limited age groups. Numerous other studies from which the age prevalence of specific impairments can be obtained are, of course, available.

The industrial examinations referred to (*3*) were made by medical officers of the United States Public Health Service (1914-21) in approximately 150 plants in 10 surveyed industries[2] located in cities in the Middle Atlantic, East North Central, and South Atlantic sections of the country. The examined male population was 51 percent foreign-born white, 46 percent native white, and 3 percent Negro; 69 percent of occupations were classified as skilled, 19 percent as unskilled labor, and 12 percent as executive, supervisory, or clerical.

The Life Extension Institute examinations (*9*) were of native-born white persons who applied for first check-up periodic health examination after their insurance policies were in force. Examinations at the "head" office (chiefly New York City) were made by a relatively small group of physicians working under close supervision for the purpose of uniformity of results; examinations in the field were made by some 9,000 physicians who "by reason of their much larger numbers have a diversity of training and technique and can receive very little supervision." The authors state that there was probably a tendency to miss an increasing number of impairments at ages over 60 years since the examinations were of a population able to come for health examination and therefore excluded disabled persons. An occupational classification of the examined groups shows "a disproportionately small number of individuals of the lower economic and social grades"; professional workers were overrepresented and semiskilled and unskilled laborers underrepresented as compared with the general population. Among those examined in the "field" is a group of some 4,000 farmers. Although no data are available by income it seems reasonable to conclude that, in view of the weighting of the total examined groups by the higher economic grades, the farmers examined were at least not markedly below, and might well have been above, an average economic level of farmers. Insofar as is known, no studies on the frequency of physical impairments among members of low-income farm families have been made elsewhere.

Source of the data.—During the period November 1939 through November 1940 the Farm Security Administration made physical examinations of all farmers and their families within selected areas

[2] The industries surveyed were pottery, post office, glass, gas, foundry, steel, chemical, cement, cigar, and garment.

to whom loans had been extended. The examinations were made by local physicians; and nearby university, hospital, and teaching centers cooperated in assembling competent teams. The examining staffs included an internist, a gynecologist, a pediatrician, an eye, ear, nose, and throat specialist, a pathologist, a dentist, psychologists, nurses, and technicians. Although different professional staffs were engaged in the several areas there was considerable overlapping of professional personnel and an effort was made to obtain uniform examinations including the use of standard forms. Routine laboratory work included urinalysis, hemoglobin determination, a test for syphilis, and, in some areas, fecal examinations for intestinal parasites and blood examinations for malaria, in which the various State and county health departments cooperated. Special studies of tuberculosis and vitamin deficiency were conducted in a few selected areas.[3]

The data were collected and transferred to punch cards under the supervision of the Farm Security Administration and subsequently made available to the United States Public Health Service. The punch cards contain special fields for routine examinations, tests, or measurements of the following: height, weight, mental age, distance vision, hearing, nasal septum, tonsils and adenoids, teeth, blood pressure, appendix, perineum, uterus, hernia, varicose veins, hemorrhoids, and lost or impaired parts of the body. Other physical defects found to be present on examination are recorded on the punch card according to an illness diagnosis code.[4] Results of laboratory tests for the presence of malaria, syphilis, intestinal parasites, and hemoglobin in the blood were recorded in certain areas.[5]

The physical examination findings for this group of low-income farm families will be presented in a series of short reports; the present report will include (1) characteristics of the examined population, and (2) prevalence of defective vision and other chronic eye conditions.

I. Characteristics of the Examined Population

The 21 counties selected for physical examination of members of all Farm Security Administration borrower families residing in those

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[3] X-ray films of the chests of all persons 6 years of age and over were made by a field unit of the U. S. Public Health Service in four localities Spotsylvania County, Va., Kershaw County, S. C., Levy County, Fla., and Henderson County, Tenn., and a determination of riboflavin deficiency in two localities, Aroostook County, Maine, and Spotsylvania County, Va.

[4] Owing to lack of time the coding of miscellaneous other defects was completed for the examined population of only 11 of the 19 areas (table 1), namely, Aroostook County, Maine, Champaign County, Ohio; Montgomery County, Ind., Callaway County, Mo., Spotsylvania County, Va., Avery County, N. C., Kershaw County, S. C., Levy County, Fla.; Henderson County, Tenn., Pope County, Ark., and Okfuskee County, Okla.

[5] Tests for malaria were made in the following nine areas Kershaw County, S. C., Worth County, Ga.; Henderson County, Tenn., parts of Carroll, Leflore, and Humphreys Counties, Miss.; Pope County, Ark., Okfuskee County, Okla.; Franklin Parish, La.; Panola County, Tex., and Williamson County, Tex.

Tests for intestinal parasites were made in the above nine areas with the addition of Spotsylvania County, Va., and Avery County, N. C.

Tests for syphilis and hemoglobin were made in all areas

counties are listed in table 2.[6] The major portion of the examined population, 71 percent, was living in the South; 29 percent resided in the Northeast and North Central sections. According to the population enumeration of 1940 (table 1), the population of the 21 selected counties was 57 percent rural farm, the individual counties varying from 34 to 89 percent. The total rural farm population of the selected counties (table 1) was almost entirely native white and Negro; in the 15 southern counties the rural farm population was 43 percent Negro. The foreign-born white population of Aroostook County, Maine (8 percent) was largely Canadian; of Howard County, Nebr. (7 percent), it was Danish, Czechoslovakian, German, and Polish; of Phillips County, Colo. (3 percent), German and Swedish; of Williamson County, Tex. (7 percent), Mexican, Czechoslovakian, Swedish, and German; of Runnels County, Tex. (2 percent), Mexican, German, and Czechoslovakian (see note 4 to table 1). The population of Okfuskee County, Okla., was 6 percent Indian.

Farms operated by Farm Security Administration borrowers are average or somewhat larger than average size except in Florida; and also in Nebraska, Colorado, and Texas where the average farm is 300 acres or more (table 1).

The percentage of farms owned by Farm Security Administration borrowers is somewhat below the average (table 1).

The Farm Security Administration has made a tabulation (*12*) of the enterprises furnishing one quarter or more of the cash income of borrower families by States. Figure 1 has been made from these data. Dairy products, particularly in the Northeast and North Central areas, and poultry and labor-off-farm in all areas are the source of one quarter or more of cash farm income in a disproportionately large percentage of borrower farms (fig. 1).

The rural rehabilitation borrower families are of a lower than average income level for farmers. Estimates made by the Bureau of Agricultural Economics, Department of Agriculture (*11*), give an average annual net income of $767 per farm in 1940. A comparable estimate of average annual net income for all rural rehabilitation farms made by the Farm Security Administration is $500 in 1940,[7] or approximately 35 percent less than that for all farms. The rural rehabilitation farmers and their families given physical examinations by the Farm Security Administration resided largely in the South which is a relatively low income area. The estimated average annual net income for 1941 of all borrowers in the States represented in the examined sample (table 2) was 17 percent lower than that for Farm Security Administration borrowers in all States.

[6] The locality "Aroostook County, Maine" includes two sections of Aroostook County only, "Carroll, Leflore, and Humphreys Counties, Miss." includes adjacent sections of the three counties.

[7] Estimates of income are of net income of farm operators exclusive of labor-off-farm.

TABLE 1 —*Nativity of the rural farm population, size of farm and tenure of farm for total States and for counties, selected for physical examination of members of Farm Security Administration borrower families*

Geographic area	State	County	Rural farm population for county Number of persons	Percent of total county population that was rural farm [1]	Percent of rural farm population of county that was— Native white	Foreign born white	Negro [1]	Other races [1]	Average acres per farm Total State [2]	FSA borrowers in total State [3]	Percent of farms owned Total State [2]	FSA borrowers in total State [3]	Percent of rural farm population of county examined as FSA borrowers
New England	Maine	Aroostook	33 607	35 6	91 7	[4] 8 1	0 1	0 09	108	118	94	74	2 6
East North Central	Ohio	Champaign	9 [illegible]	38 4	9[illegible] 7	5	1 7	02	94	139	74	27	4 4
	Indiana	Montgomery	9 332	34 5	99 8	2	0	00	107	134	72	18	3 8
West North Central	Missouri	Callaway	11 3[illegible]0	49 2	93 1	4	[illegible]	00	136	163	64	37	5 9
	Nebraska	Howard	[illegible]429	64 5	93 4	[4] 6 6	0	00	391	235	47	9	10 2
Mountain	Colorado	Phillips	[illegible] 602	2[illegible]	97 3	[4] 2 7	[illegible]	00	613	378	63	34	15 1
South Atlantic	Virginia	Spotsylvania	[illegible] 4[illegible]9	[illegible]5 4	68 3	6	31 1	00	94	136	73	57	[illegible] 1
	North Carolina	Avery	[illegible] 246	[illegible]	98 6	1	1 3	00	68	92	56	47	2 6
	South Carolina	Kershaw	19 [illegible]	60 4	41 0	04	59 0	00	82	84	44	29	5 4
	Georgia	Worth	17 0[illegible]2	79 9	[illegible]2 4	01	47 6	00	110	122	40	33	4 4
	Florida	Levy	4 506	35 9	73 8	2	26 0	00	134	71	75	66	16 4
East South Central	Tennessee	Henderson	12 340	44 2	93 2	01	6 8	00	75	112	60	46	4 3
		Carroll	18 459	[illegible] 3	39 8	0[illegible]	60 2	00					
	Mississippi	Leflore	33 948	63 4	14 0	03	85 9	02	66	85	34	57	[5] 9
		Humphreys	20 807	79 2	22 1	02	77 9	02					
West South Central	Arkansas	Pope	13 [illegible]	53 2	96 [illegible]	5	2 [illegible]	01	83	90	47	46	6 0
	Oklahoma	Okfuskee	1[illegible] [illegible]1	60 4	64 8	1	27 0	[4] 8 14	194	161	46	21	5 1
	Louisiana	Franklin	27 2	[illegible]4 5	60 2	1	39 7	00	67	59	41	34	4 1
		Lavaca	17 354	77 1	51 8	05	48 1	00					2 8
	Texas	Williamson	22 173	53 2	81 8	[4] 6 5	11 7	00	329	152	51	29	1 5
		Runnels	9 997	52 9	97 3	[4] 2 0	7	00					3 1
All counties			321 097	57 3	64 4	1 6	33 6	42	[6] 162	[6] 137	[6] 58	[6] 39	3 6

[1] From Census of Population 1940
[2] From Census of Agriculture 1940
[3] From U S Dept of Agriculture Farm Security Administration (1943)
[4] The foreign born population of Aroostook Co Maine was 92 percent Canadian of Howard Co, Nebr, 42 percent Danish 17 percent Czechoslovakian 15 percent German 10 percent Polish 7 percent Swedish of Phillips Co Colo 41 percent German 31 percent Swedish 7 percent British, 7 percent Danish, 5 percent Canadian 5 percent Russian of Williamson Co Tex 36 percent Mexican 24 percent Czechoslovakian 15 percent Swedish 13 percent German of Runnels Co, Tex 48 percent Mexican, 26 percent German 14 percent Czechoslovakian The population of Okfuskee Co, Okla was 6 percent Indian
[5] Based on total rural farm population of 3 counties
[6] Average of 17 States

Practically all Farm Security Administration borrower families residing in the selected areas came to the clinics for examination—2,167 white and 310 Negro families or 9,776 white persons and 1,714 Negroes (table 2). In all counties combined, this included 4 percent of the total county rural farm population (table 1). Based on families of known size, 91 percent of the members of white and 94 percent of those of Negro borrower families were examined. The average size of family

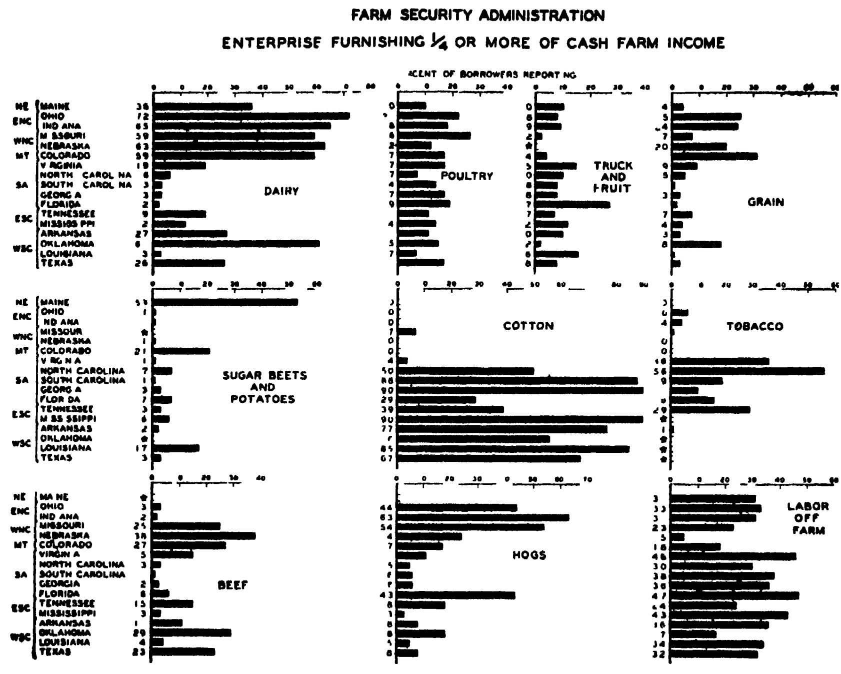

FIGURE 1.—Percentage of borrowers reporting specified enterprises as furnishing one-quarter or more of cash farm income—Farm Security Administration borrowers in 17 States, 1941 (12)

of the examined population is relatively large, 5.0 persons per family for white and 5.6 for Negro. Since relatively young heads of families were selected for Farm Security Administration loans, the mean age of the population is low, 23.5 years for whites and 22.6 for Negroes (table 2). The percentage age distribution of the white and Negro persons examined is given in table 3 and figure 2, and compared with the enumerated rural farm population (1940) of the 17 States represented and with the total population of the United States (1940). In both the white and Negro examined populations, the percentage of children under 15 years of age is relatively high, as is also the group 35 to 45 years.

TABLE 2.—*Number of persons receiving physical examination—members of Farm Security Administration borrower families in 19 localities, 1940*

Geographic area	State	County	Number of families examined: White	Number of families examined: Negro	Number of persons examined: White	Number of persons examined: Negro	Percent examined[1]: White	Percent examined[1]: Negro	Number of persons per family[1]: White	Number of persons per family[1]: Negro	Mean age of examined population with probable error: White	Mean age of examined population with probable error: Negro
New England	Maine	Aroostook	156		884		92.3		6.8		21.8±0.40	
East North Central	Ohio	Champaign	122		429		81.9		4.7		24.0±.58	
	Indiana	Montgomery	109		355		91.4		3.8		27.0±.67	
West North Central	Missouri	Callaway	165		675		90.8		4.5		25.2±.48	
	Nebraska	Howard	170		556		94.1		4.9		23.8±.50	
Mountain	Colorado	Phillips	100		394		92.3		4.4		24.6±.61	
South Atlantic	Virginia	Spotsylvania	39	39	172	158	94.2	93.2	5.1	4.9	25.5±.99	24.2±1.10
	North Carolina	Avery	63		239						24.8±.80	
	South Carolina	Kershaw	171	59	679	399	93.9	97.0	6.4	6.2	22.1±.44	21.2±.58
	Georgia	Worth	105	33	557	202	95.7	96.5	5.5	6.3	20.8±.46	21.5±.81
	Florida	Levy	151	32	593	145	90.0	100.0	4.4	4.1	26.8±.52	29.4±1.16
East South Central	Tennessee	Henderson	113		533		93.0		5.1		22.3±.49	
	Mississippi	Carroll, Leflore, Humphreys	87	41	421	216	90.3	92.7	5.5	5.8	22.7±.55	23.3±.79
West South Central	Arkansas	Pope	162	13	745	78	90.0	89.7	5.1	6.7	22.3±.40	20.4±1.20
	Oklahoma	Okfuskee	130	35	601	213	94.8	92.2	4.9	6.6	24.3±.49	20.6±.78
	Louisiana	Franklin	210	18	1 003	111	95.3	91.4	5.1	6.8	21.1±.34	20.5±1.10
	Texas	Panola	74	40	296	132	97.5	98.1	4.2	5.1	25.5±.70	23.8±.85
		Williamson	80		333		96.6		4.3		24.5±.67	
		Runnels	70		311		93.4		4.8		25.5±.68	
19 localities			2 167	310	9 776	1 714	91.2	94.1	5.0	5.6	23.5±.12	22.6±.29

[1] Percent of individuals examined and number of persons per family are for examined families of known size.

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TABLE 3.—*Percentage age distribution of members of Farm Security Administration borrower families and of the total rural farm population of 17 States*

Age	Population examined by Farm Security Administration [1]												Rural farm population [2]		
	White			Negro			White			Negro					
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Number						Percentage age distribution								
All ages	9 776	4 993	4 783	1 714	851	863	100.0	100.0	100.0	100.0	100.1	100.0	100.2	99.9	100.2
Under 5	1 229	595	634	211	95	116	12.6	11.9	13.3	12.3	11.2	13.4	11.3	10.9	11.7
5–9	1 484	771	713	288	141	147	15.2	15.4	15.0	16.8	16.6	17.0	11.5	11.2	11.8
10–14	1 633	847	[illegible]	303	162	141	16.7	17.0	16.4	17.7	19.0	16.3	11.8	11.7	11.9
15–19	1 032	537	495	237	116	121	10.6	10.8	10.3	13.8	13.6	14.0	11.4	11.4	11.5
20–24	509	206	303	91	43	48	5.2	4.1	6.3	5.3	5.1	5.6	8.7	8.9	8.5
25–29	[illegible]	246	277	63	18	45	5.3	4.9	5.8	3.7	2.1	5.2	7.3	7.2	7.3
30–34	629	288	341	71	36	35	6.4	5.8	7.1	4.1	4.2	4.1	6.2	6.1	6.3
35–39	631	308	323	84	22	62	6.5	6.2	6.8	4.9	2.6	7.2	5.8	5.5	6.1
40–44	607	313	294	90	43	47	6.2	6.3	6.1	5.3	5.1	5.4	5.2	5.0	5.3
45–49	523	264	259	90	53	37	5.3	5.3	5.4	5.3	6.2	4.3	4.9	4.8	4.9
50–54	426	259	167	71	42	29	4.4	5.2	3.5	4.1	4.9	3.1	4.3	4.1	4.1
55–59	248	147	101	50	38	12	2.5	2.9	2.1	2.9	4.5	1.4	3.6	3.9	3.4
60–64	156	112	44	32	20	12	1.6	2.2	.9	1.9	2.4	1.4	2.8	3.1	2.6
65 and over	146	100	46	33	22	11	1.5	2.0	1.0	1.9	2.6	1.3	5.4	5.9	4.8

[1] Population examined in 19 localities (table 2).
[2] Enumerated rural farm population of 17 States, 1940 (table 1).

The mean age of the examined population in separate localities (table 2) varies significantly from the average in two counties only, Montgomery County, Ind., and Levy County, Fla. In these areas there were relatively fewer children under 20 years of age. On the whole, however, the age distributions of the examined populations in the several localities are similar enough that age correction for inter-State comparisons of prevalence rates is not essential.

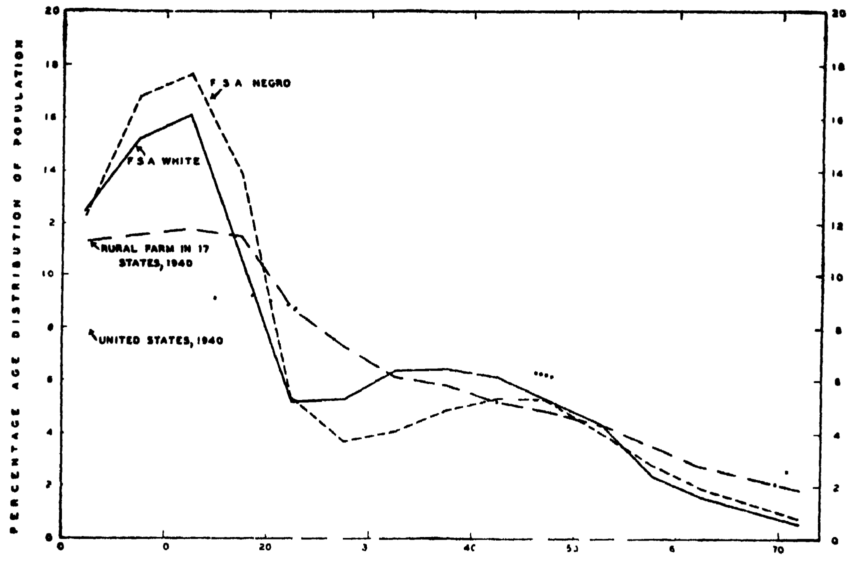

FIGURE 2 The percentage age distribution of members of borrower families given physical examinations by the Farm Security Administration, 1940 in a total of 19 and 9 localities for whites and Negroes, respectively, compared with the percentage age distribution of the rural farm population in a total of 17 States, and of the total population of the United States, 1940

II. Defective Vision and Other Chronic Eye Conditions

PREVALENCE OF DEFECTIVE VISION AS DETERMINED BY THE SNELLEN TEST FOR SPECIFIC AGES

The visual acuity of 7,932 white and 1,366 Negro persons of 5 years of age and over was tested with the Snellen test chart This test reveals practically all cases of myopia but does not discover a large percentage of the hyperopic or astigmatic eye conditions (7). The Snellen test chart consists of rows of letters of increasing size; the size of the letters being such that vision is normal when the chart can be read at the specified distance for each row of letters Results of the test are recorded as a fraction; that is, the numerator of the fraction is the number of feet at which the chart is placed, the denominator of the fraction designates the minimum size of letter which can be read expressed as the number of feet at which vision is normal for the spe-

cified size of letter. Normal vision is defined as 20/20. Observations were recorded as of the "better" and "poorer" eye. They have been assembled into 5 groups; namely, 20/20 (normal vision) in both eyes; 20/20 (normal vision) in one eye only and 20/25 or worse in the poorer eye; 20/25 or 20/30 in the better eye and 20/25 or worse in the poorer eye; 20/40 or 20/50 in the better eye and 20/40 or worse in the poorer eye; and 20/70 or worse in both eyes.

The Snellen test is relatively objective; the results of the test vary somewhat, however, when done by different examiners and under different environmental conditions such as lighting and different subjective conditions such as the general fatigue of those examined. The observed prevalence of defective vision in different localities shows some inconsistencies when the rates specific for age and extent of defective vision are examined and, therefore, indicates some variability in the method of recording results in these data in addition to a sampling variability as measured by the probable error. Variation in the recording of Snellen test results, however, is relatively slight compared with less objective observations such as the prevalence of enlarged or diseased tonsils, for example. In these data there was also a language difficulty particularly among the French Canadians examined in Maine. A high prevalence of granular lids among the children in Arkansas made visual testing difficult in that area.

Table 4 shows the result of the Snellen test made on white persons of 5–14, 15–44, and 45 or more years of age for each of the 19 localities in which members of Farm Security Administration borrower families were examined. The range of variability in the percentage with defective vision in different localities is considerable -from 17 to 59 percent for 15–44 years of age and from 61 to 97 percent at 45 years and over. As determined by the probable error, the number of localities in which the examined population was recorded to have a consistently and significantly better or poorer vision than the average is comparatively few. A low percentage with defective vision was recorded in Callaway County, Mo., Worth County, Ga., and Carroll, Leflore, and Humphreys Counties, Miss., for all age groups and in Panola, Williamson, and Runnels Counties, Tex., for 15–44 years; a high percentage was recorded in Phillips County, Colo., and Levy County, Fla., for all age groups over 5 years, and in Pope County, Ark., and Aroostook County, Maine, for children 5–14 years. The majority of the localities, however, record an average prevalence of defective vision.

The results of the Snellen test for specific ages in all localities combined are shown in table 5 for whites and in table 6 for Negroes and whites in the areas in which Negro families were examined. Figure 3 is an over-all representation of the cumulative prevalence of poor, moderate, slightly defective, and normal vision in specific age

TABLE 4.—*Percentage of white persons in three age groups with the specified vision as determined by the Snellen test—members of Farm Security Administration borrower families in 19 localities, 1940*

Geographic area	State	County	5-14 years: Number examined for vision	5-14 years: 20/25 or worse in either eye (percent)	5-14 years: 20/40 or worse in better eye (percent)	15-44 years: Number examined for vision	15-44 years: 20/25 or worse in either eye[1] (percent)	15-44 years: 20/40 or worse in better eye (percent)	45 years and over: Number examined for vision	45 years and over: 20/25 or worse in either eye[1] (percent)	45 years and over: 20/40 or worse in better eye (percent)
New England	Maine	Aroostook	247	46.1	6.1	260	43.8	5.8	109	78.0	23.9
East North Central	Ohio	Champaign	103	29.1	4.9	182	31.3	7.1	65	67.7	32.3
	Indiana	Montgomery	83	37.3	8.4	147	42.9	8.2	75	82.7	40.0
West North Central	Missouri	Callaway	196	8.7	1.0	235	17.4	1.3	114	60.5	21.9
	Nebraska	Howard	184	27.7	6.5	217	38.7	5.5	92	81.7	30.5
Mountain	Colorado	Phillips	96	40.9	10.4	164	59.1	17.1	63	87.3	47.6
South Atlantic	Virginia	Spotsylvania	53	22.6	3.8	56	25.0	1.8	26	76.9	38.5
	North Carolina	Avery	61	23.0	0	99	41.4	9.1	38	84.2	52.6
	South Carolina	Kershaw	221	28.4	4.0	267	40.8	6.4	92	83.0	46.8
	Georgia	Worth	179	9.5	3.4	215	24.7	6.[illegible]	60	61.7	35.0
	Florida	Levy	86	45.3	5.8	255	57.6	7.1	120	96.7	56.7
East South Central	Tennessee	Henderson	20	30.0	5.0	226	41.6	5.3	63	88.9	57.1
	Mississippi	Carroll, Leflore, Humphreys	132	15.9	1.5	163	22.7	3.7	55	61.8	23.6
West South Central	Arkansas	Pope	205	40.0	5.9	317	40.4	6.6	83	75.9	38.6
	Oklahoma	Okfuskee	140	19.3	7	241	32.8	6.2	107	76.6	39.3
	Louisiana	Franklin	293	19.8	3.8	396	26.8	5.8	107	76.6	37.4
	Texas	Panola	77	19.5	2.6	127	26.0	1.6	47	83.0	23.4
		Williamson	80	12.5	1.3	125	18.4	4.0	60	76.7	40.0
		Runnels	79	21.5	2.5	125	24.8	4.0	62	82.3	32.3
19 localities			2,685	26.9	4.2	3,819	35.4	6.1	1,428	78.2	37.6

[1] The range of the probable error of the percentage with defective vision (20/25 or worse in either eye) is from 1.4 to 3.9 percent for the age group 5-14 years, from 1.5 to 3.9 percent for the age group 15-44 years, and from 1.1 to 5.6 percent for the age group 45 years and over.

TABLE 5.—*Percentage of white persons in specific age groups with the specified vision as determined by the Snellen test—members of Farm Security Administration borrower families in a total of 19 localities, 1940*

Age	Number examined for vision	20/20 or better in both eyes (percent)	20/20 or better in one eye only (percent)	20/25 or 20/30 in better eye (percent)	20/40 or 20/50 in better eye (percent)	20/70 or worse in better eye (percent)
			Both sexes			
5 years and over	7 932	69.7	11.7	17.1	5.9	5.3
5-9	1 101	70.6	8.9	16.3	3.0	1.2
10-14	1 584	74.6	9.1	12.1	2.5	1.7
15-19	1 008	73.0	10.9	11.6	2.6	1.9
20-24	494	68.0	13.2	14.0	2.8	2.0
25-29	510	68.8	13.3	13.9	2.5	1.4
30-34	615	64.2	13.3	15.9	3.6	2.9
35-39	615	58.2	14.0	19.3	4.4	4.1
40-44	577	50.6	14.9	25.6	4.9	4.0
45-49	501	32.9	18.0	27.5	10.0	11.6
50-54	412	21.6	12.1	28.2	19.7	18.4
55-59	234	16.7	12.0	23.1	24.8	23.5
60-64	150	7.3	10.7	30.7	23.3	28.0
65 and over	131	5.3	6.1	25.2	29.8	33.6
			Male			
5 years and over	4 100	63.2	11.9	15.8	5.3	3.8
5-9	567	71.4	9.2	15.5	2.8	1.1
10-14	819	77.0	8.8	10.7	1.6	1.8
15-19	[illegible]	78.3	10.2	7.9	2.1	1.5
20-24	199	73.9	12.1	10.1	2.5	1.5
25-29	242	75.6	13.2	8.7	1.2	1.2
30-34	281	70.1	12.1	12.8	1.8	3.2
35-39	301	67.8	13.0	13.3	2.7	3.3
40-44	302	59.3	13.6	20.9	4.3	2.0
45-49	[illegible]	40.5	23.3	24.1	7.0	5.1
50-54	255	31.0	14.9	30.6	16.5	7.1
55-59	[illegible]	22.2	14.6	29.2	22.9	11.1
60-64	110	8.2	12.7	38.2	19.1	21.8
65 and over	93	7.5	6.5	28.0	30.1	26.0
			Female			
5 years and over	3 832	66.0	11.6	19.1	6.5	6.8
5-9	534	69.7	8.6	17.2	3.2	1.3
10-14	765	72.0	9.4	13.5	3.5	1.6
15-19	478	67.2	11.7	15.7	3.1	2.3
20-24	[illegible]	64.1	13.9	16.6	3.1	2.4
25-29	268	62.7	13.4	18.7	3.7	1.5
30-34	334	59.3	14.4	18.6	5.1	2.7
35-39	314	49.0	15.0	25.2	6.1	4.8
40-44	[illegible]	41.1	16.4	30.9	5.5	6.2
45-49	211	25.0	12.3	31.1	13.1	18.4
50-54	[illegible]	6.4	7.6	24.2	24.8	36.9
55-59	90	7.8	7.8	13.3	27.8	43.3
60-64	40	5.0	5.0	10.0	35.0	45.0
65 and over	38		5.3	18.4	28.9	47.4

groups of the white examined population From 30 to 70 years of age the percentage with defective vision increases from approximately 30 to 95 percent; from 45 to 70 years of age the percentage with moderate and markedly defective vision (20/40 or worse in better eye) increases from approximately 10 to 60 percent

The data of table 7 are taken from studies of defective vision among other population groups and are reproduced here for comparison with low-income farm families The age specific prevalence of defective

vision from various sources is plotted on semi-logarithmic paper in figure 4. Although rough comparisons can be made in the actual results of the Snellen test conducted by different groups of examiners the relative age prevalence furnishes more valid comparisons.

The general agreement among the various data shown in figure 4 is striking. Both the Farm Security Administration data and schoolboys examined in eastern counties of the United States (*5*) show a decline in the percentage with defective vision as indicated by the Snellen

TABLE 6.—*Percentage of Negro and white persons in specific age groups with the specified vision as determined by the Snellen test—members of Farm Security Administration borrower families in a total of nine localities* [1] *1940*

Age	Negro: Number examined for vision	Negro: 20/20 or better in both eyes (percent)	Negro: 20/20, 20/25 or 20/30 in better eye (percent)	Negro: 20/40 or worse in better eye (percent)	Negro: Defective vision 20/25 or worse in either eye (percent)	White: Number examined for vision	White: 20/20 or better in both eyes (percent)	White: 20/20, 20/25 or 20/30 in better eye (percent)	White: 20/40 or worse in better eye (percent)	White: Defective vision 20/25 or worse in either eye (percent)
Both sexes										
5 years and over	1 366	71.7	17.8	[illegible]	28.3	4 122	61.1	[illegible]	10.9	38.6
5–9	190	87.9	9.4	2.7	12.1	514	75.5	21.0	3.6	24.5
10–14	292	91.1	8.6	.3	8.9	832	75.8	20.6	3.6	24.2
15–19	232	82.3	15.5	2.2	17.7	559	73.5	22.3	4.1	26.5
20–24	89	78.7	18.0	3.4	21.3	278	70.9	24.1	5.0	29.1
25–34	130	83.1	14.6	2.3	16.9	591	66.5	28.8	4.7	33.5
35–44	171	71.9	27.2	.9	28.1	611	54.3	37.2	8.5	45.7
45–54	153	45.1	32.7	22.2	54.9	450	26.9	40.2	32.9	73.1
55–64	81	27.2	40.7	32.1	72.8	188	12.2	37.8	50.0	87.8
65 and over	28	14.3	28.5	57.2	85.7	59	5.1	28.8	66.1	94.9
Male										
5 years and over	683	71.2	18.6	10.2	28.8	2 153	63.5	26.6	9.9	36.5
5–9	87	86.2	11.4	2.3	13.8	240	77.1	19.3	3.6	22.9
10–14	153	90.2	9.8		9.8	437	78.3	18.1	3.7	21.7
15–19	113	81.4	16.8	1.8	18.6	287	78.4	17.8	3.8	21.6
20–24	44	77.3	18.1	4.5	22.7	109	69.7	25.7	4.6	30.3
25–34	54	85.2	14.8		14.8	283	69.6	26.5	3.9	30.4
35–44	64	78.1	18.8	3.2	21.9	304	61.2	31.6	7.2	38.8
45–54	91	56.0	26.4	17.6	44.0	263	34.2	43.7	22.0	65.8
55–64	57	31.6	40.3	28.0	68.4	126	15.9	45.2	38.9	84.1
65 and over	20	15.0	40.0	45.0	85.0	44	6.8	27.2	65.9	93.2
Female										
5 years and over	683	75.1	17.0	7.9	24.9	1 989	59.0	29.0	11.9	41.0
5–9	103	89.3	7.8	2.9	10.7	274	73.7	22.6	3.7	26.3
10–14	139	92.1	7.2	.7	7.9	395	73.2	23.3	3.6	26.8
15–19	119	83.2	14.3	2.5	16.8	272	68.4	27.2	4.4	31.6
20–24	45	80.0	17.8	2.2	20.0	169	71.6	23.1	5.4	28.4
25–34	76	81.6	14.5	3.9	18.4	308	63.6	30.8	5.5	36.4
35–44	107	68.2	24.3	7.4	31.8	307	47.6	42.6	9.8	52.4
45–54	62	29.0	41.9	29.0	71.0	187	16.6	35.3	48.1	83.4
55–64	24	16.7	41.7	41.6	83.3	62	4.8	22.5	72.6	95.2
65 and over	8	12.5		87.5	87.5	15		33.3	66.7	100.0

[1] The localities included are those for which the number of persons examined is shown for Negroes in table 2

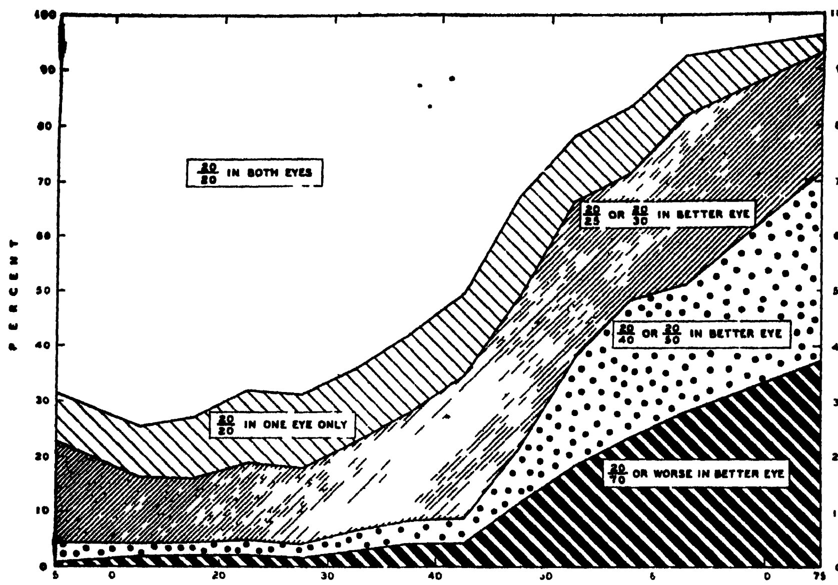

FIGURE 3 The cumulated prevalence of specified degrees of defective vision as determined by the Snellen test for white persons in specific age groups members of Farm Security Administration borrower families in 19 localities, 1940

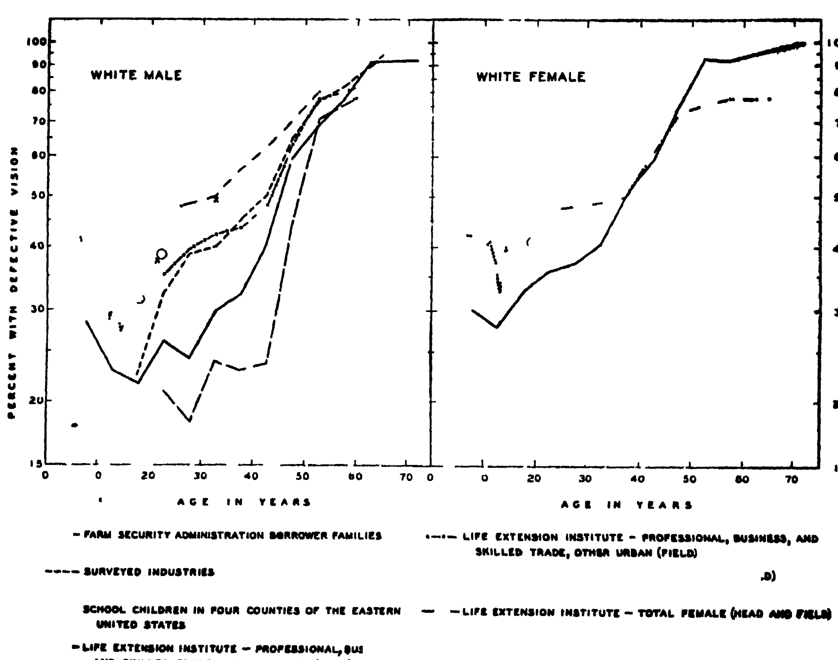

FIGURE 4 —Relative age prevalence of defective vision as determined by the Snellen test—members of Farm Security Administration borrower white families in 19 localities, 1940, compared with other available data Poorer than 20/20 in one or both eyes is defined as defective vision

test at ages under 20 years; females show a decline at ages under 15 years. This observation is in agreement with the fact that the anatomical development of the eye among males is not complete until about 20 years of age (*5*). After 20 years of age the percentage of males with defective vision increases in each successive age group; for industrial workers (*3*, *10*) the increase is most rapid between 20 and 30 years of age, whereas for agricultural workers (*10*) the increase is most rapid from 45 to 55 years of age. From 20 to 50 years of age defective vision is more frequent among industrial workers than among farmers; after 50 years of age, however, there is little difference in the occurrence of defective vision among industrial and agricultural workers.

TABLE 7.—*Percentage of white persons in specific age groups with defective vision as determined by the Snellen test—members of Farm Security Administration borrower families, 1940, and comparable data*

Age	Farm Security Administration borrower families		Surveyed in industries[1]	School children in 4 counties of the eastern U S		Life Extension Institute					National Youth Administration[7]		Selectees[8]
						Male							
							Professional, business, and skilled trade		Agricultural (field)[5]	Total female[6]			
	Male	Female	Male	Male[2]	Female[3]	Total[4]	N Y city (head)[5]	Other cities (field)[5]			Male	Female	Male
	Percent with defective vision[9]												
5-9	28.6	30.3		39.8	41.6								
10-14	23.0	28.0		31.4	38.5								
15-19	21.7	32.8	22.6	30.1	35.7						31.4	40.9	
20-24	26.1	35.9	32.4			36.2	47.7	35.5	21.0	47.6	38.6		37.6
25-29	24.4	37.3	38.7			39.5		39.4	18.2				
30-34	29.9	40.7	39.9			42.0	50.2	42.6	23.9	48.9			49.4
35-39	32.2	51.0	45.1			43.8	56.9	43.7	23.2	50.8			
40-44	40.7	58.9	50.6			48.6	62.6	48.6	23.8	60.7			
45-49	59.5	75.0	65.3			64.5		63.9	44.7	72.9			
50-54	69.0	93.6	77.5			77.2		78.0	71.4	75.7			
55-59	77.8	92.2	82.2			81.7	80.0			77.9			
60-64	91.8	95.0	94.6			82.9		82.3	78.2	77.7			
65 and over	92.5	100.0				83.3							

[1] From Britton and Thompson (*3*), 1914-21. The Snellen test data are for 8 industries: pottery, post office, glass, gas, foundry, steel, cement, and cigar.
[2] From Collins and Britten (*5*), 1915-17. The percentage with defective vision is given for single years of age. The percentage for the age group 15-19 years in this table is for boys 15-17 years of age.
[3] From Collins (*4*), 1915-17. The percentage with defective vision is given for single years of age. The percentage for the age group 15-19 years in this table is for girls 15-16 years of age.
[4] From Sydenstricker and Britten (*9*), 1922-25.
[5] From Sydenstricker and Britten (*10*), 1922-25.
[6] From Britten (*1*), 1922-25.
[7] From McDowell and Meroney (*8*), 1941. The percentages for males are for the age groups 16-20 and 21-24 years, for females 16-24 years.
[8] From Karpinos (*6*), 1943. The percentages are for males, 18-24 and 25-39 years of age.
[9] Poorer than 20/20 in one or both eyes is defined as defective vision.

Considering the two agricultural groups examined, defective vision is more frequent among the Farm Security Administration borrowers at every age group under 50 years than among the farmers examined

by the Life Extension Institute; from 20 to 50 years of age the percentages for the Farm Security Administration farmers are, on the average, approximately 30 percent higher. These two sets of agricultural data differ in several respects. The Farm Security Administration families are of a low income group, whereas the agricultural workers examined by the Life Extension Institute are probably of a better-than-average income class. With respect to blindness as associated with income class the National Health Survey (*2*) shows a definite relationship between income and the prevalence of blindness in either one or both eyes for both males and females; in these data there is a marked increase in blindness as family income decreases, exclusive of those families receiving relief. Although this is probably due to greater accident and disease hazards among lower income groups, the reverse effect probably also operates, blindness causing a decline in income. With respect to the general standards of health of the two farm groups, it was stated earlier that the Life Extension Institute examinations were of persons who had passed a medical examination for life insurance and who had applied for a first check-up health examination. This would largely exclude definitely disabled persons. On the other hand, the Farm Security Administration data pertain to farmers and their families who have applied for rehabilitation loans. While illness may be wholly or in part responsible for a farmer's application for a loan, it seems unlikely that defects of vision alone could be a major cause of lowered farm income although defective vision might presumably be associated with other and more disabling kinds of defects.

Moreover, it is obvious that variations in examining standards lead to different recorded results. In the Farm Security Administration examinations 20/25 or worse in either eye is defined as a defect of vision. In the "10 surveyed industries" data defective vision is defined as 20/30 or worse in either eye. No subdivision of the total defective vision into slight and marked degree is made in the Life Extension Institute data and therefore it is impossible to say whether defective vision, in these data, is defined as 20/25 or worse or 20/30 or worse in either eye. Table 7 shows a comparison of the prevalence of defective vision for the group of professional, business, and skilled trade examined by the Life Extension Institute in New York City (head office) and in other urban areas (field offices). The authors' explanation of the high prevalence shown for those examined at the head office is the more careful and consistent examinations made there. Examinations of the agricultural group were made in field offices. Moreover, the recorded prevalence of defective vision for Farm Security Administration clients in separate States (table 4) showed variability in recorded results in spite of the relatively objective nature of the Snellen test. In view of the uncontrollable factors involved, therefore, it is difficult to make more than

rough comparisons between the actual prevalence rates of defective vision as obtained by different surveys upon diverse groups of the population.

Females among the Farm Security Administration borrower families (fig. 4) show a smaller percentage with defective vision than females of the Life Extension Institute data at ages 20 to 34 and identical percentages for ages 35 to 50 years.

Defective vision among males and females for specific age groups is compared in figure 5. Defective vision increases after 20 years for males and after 15 years for females. White females have more

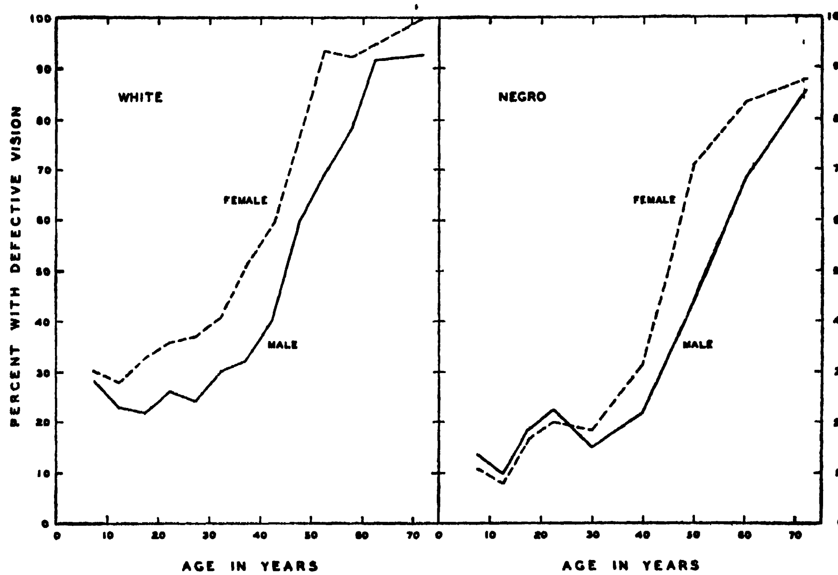

FIGURE 5.—Prevalence of defective vision as determined by the Snellen test among white and Negro males and females in specific age groups—members of Farm Security Administration borrower families in 19 and 9 localities, respectively, 1940

defective vision than white males. The percentage difference between the curves of defective vision for white males and females is greatest at ages 15–44 years; at 60 years of age and over there is a slight difference only. Among the Negro population more females than males have defective vision after 25 years of age. Under 25 years and also at 65 years and over there is very little difference between the percentages for males and females. The observation that there is a higher percentage of defective vision among females than males is borne out by the Life Extension Institute data (table 7).

A comparison of the percentages of whites and Negroes with defective vision is shown in figure 6; the data for whites are based on those States in which Negroes were examined. Defective vision is less frequent among Negroes than whites in these data for every

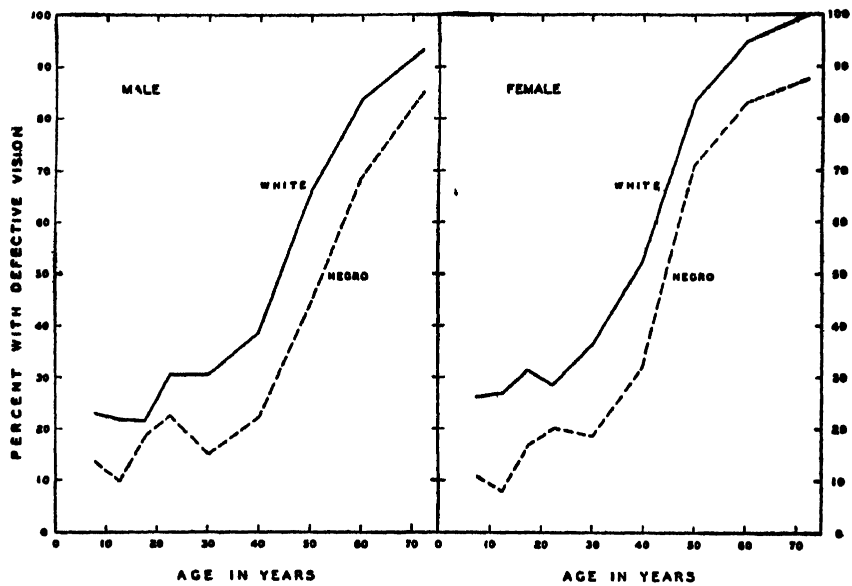

FIGURE 6.—Prevalence of defective vision as determined by the Snellen test among whites and Negroes for males and females in specific age groups—members of Farm Security Administration borrower families in 9 localities, 1940.

age group and for both males and females. Percentages of whites and Negroes with defective vision for individual areas have been computed and show that whites have a higher percentage than Negroes in practically every locality. The number of Negroes examined in separate areas is relatively small so that the differences between the white and Negro percentages are not always significant; the Negro percentages are consistently less than the white, however.

The National Youth Administration data (*8*) and examinations of selectees made in February 1943 (*6*) show more defects of vision among whites than Negroes as follows:

Race	National Youth Administration		Selectees	
	Male 16–24 years	Female 16–24 years	Male 18–24 years	Male 25–39 years
	Percent with defective vision (20/25 or worse in either eye)			
White	32 9	40 9	37 6	49 4
Negro	29 3	36.7	31 0	40 6

These data, therefore, corroborate the observation that defective vision is less frequent among Negroes than whites. Both Negroes and whites were examined in the same Farm Security Administration clinics and by the same examining staffs. The economic status of Negroes and whites examined could not have been widely different,

and, therefore, the data seem to be favorable for a racial comparison. Since, however, a larger proportion of Negro than white agricultural workers are in all likelihood farm laborers rather than farm operators and since loans were made by the Farm Security Administration to farm operators only, it is likely that the Negroes examined represent a better social class among Negro farmers than the whites among all white farmers.

TABLE 8.—*Percentage of white persons wearing glasses*[1] *among (a) members of Farm Security Administration borrower families in a total of 19 localities, 1940; (b) school children in 4 counties in the eastern United States, and (c) persons given medical examination by the Life Extension Institute*

Color, sex, and source	Percentage of persons examined wearing glasses			Percentage of persons with defective vision wearing glasses			Percentage of persons with vision of 20/40 or worse in better eye wearing glasses		
	5-19	20-39	40 and over	5-19	20-39	40 and over	5-19	20-39	40 and over
	Percent								
White male									
Farm Security Administration	1.6	4.0	8.9	5.8	10.3	12.8	14.5	28.3	24.4
School children[2]	1.6			4.4			9.0		
Life Extension Institute total[3]		20.9	39.0		50.6	60.6			
Professional, business, and skilled trade									
New York City (head)[4]		21.8	33.0		42.7	45.0			
Other urban (field)[4]		22.4	41.4		54.1	64.6			
Agricultural (field)[4]		11.2	32.0		50.5	62.4			
White female									
Farm Security Administration	2.7	9.2	26.7	7.9	17.9	32.9	23.6	30.0	50.5
School children[2]	2.2			5.6			13		
Life Extension Institute total[5]		26.5	39.2		54.0	56.7			

[1] The percentage of persons wearing glasses includes persons wearing glasses for any visual defect.
[2] From Collins (*4*), 1915-17. School children, 6-16 years of age, in Spartanburg, S. C., and nearby villages, Frederick County, Md., New Castle County, Del., and Nassau County, N. Y.
[3] From Sydenstricker and Britten (*9*), 1922-25.
[4] From Sydenstricker and Britten (*10*), 1922-25.
[5] From Britten (*1*), 1922-25.

The percentage of persons wearing glasses for any defect of vision among those examined by the Farm Security Administration is small compared with the percentage with defective vision. At 40 years and over, 9 percent of males and 27 percent of females examined were wearing glasses; 13 percent of males and 33 percent of females with any degree of defective vision were wearing glasses; and 24 percent of males and 51 percent of females with markedly defective vision (20/40 or worse in better eye) were wearing glasses for some defect of vision (table 8). For children 5-19 years of age the percentage wearing glasses is slightly more than that for school children examined in four rural localities of the eastern United States (1915-17). Among persons examined by the Life Extension Institute, however, glasses were worn much more frequently than among the low-income farm families, particularly among males.

PREVALENCE OF OTHER EYE DEFECTS AND CHRONIC DISEASES

The occurrence of other eye defects and chronic diseases found on physical examination has been coded and tabulated in these data for only 11 of the 19 localities, including 5 localities where Negroes were examined. Table 9 gives the recorded prevalence of specific eye conditions for white and Negro males and females per 100 persons examined for any defect. Among the defects included in table 9 the rate for pterygium only is significantly higher for males than females (white); other defects show no significant difference between the rates for the two sexes. Negroes have significantly higher rates than whites for cataract[8] and pterygium; whites have significantly higher rates for strabismus and trachoma.

TABLE 9.—*Prevalence of specific eye diseases among white and Negro males and females—members of Farm Security Administration borrower families, 1940*

Race and sex	Number of persons examined	Glaucoma	Cataract	Strabismus	Trachoma and suspected trachoma[1]	Inflammatory diseases of eye and eyelid	Pterygium	Blind in one eye	Blind in both eyes
		Percent							
White male (11 localities)[2]	3,000	0.13	1.77	2.87	1.33	0.63	2.87	0.50	0.03
White female (11 localities)[2]	2,905	.10	1.20	2.48	1.03	.86	1.34	.34	.07
Negro male (5 localities)[3]	494		3.64	.61	.20	.61	6.68	1.01	
Negro female (5 localities)[3]	499		3.01	.60		.20	6.41	.40	.40

[1] The total of 70 cases includes 14 diagnosed as definite trachoma; the remaining 56 cases were diagnosed as suspected trachoma recommended for observation.

[2] The 11 localities are: Aroostook County, Maine, Champaign County, Ohio, Montgomery County, Ind., Callaway County, Mo., Spotsylvania County, Va., Avery County, N. C., Kershaw County, S. C., Levy County, Fla., Henderson County, Tenn., Pope County, Ark., and Okfuskee County, Okla.

[3] The 5 localities are: Spotsylvania County, Va., Kershaw County, S. C., Levy County, Fla., Pope County, Ark., and Okfuskee County, Okla.

The high prevalence of cataract in Florida and of trachoma and suspected trachoma in Arkansas is outstanding. Among 67 white cases reported in Pope County, Ark., 13 were diagnosed as trachoma and treatment recommended; 54 were recorded as suspected trachoma recommended for observation. In this connection, Veldee (*14*) records a high prevalence of folliculosis (30 percent of persons under 20 years of age) in Pinellas County, Fla. He states that folliculosis may be very widespread among children of school ages and is frequently diagnosed as trachoma; the disease is mild and runs a brief course compared with trachoma, disappearing spontaneously.

Table 10 gives the age-specific prevalence of cataract, strabismus, trachoma and suspected trachoma, and pterygium as found on physical examination. The highest prevalence of "trachoma and suspected trachoma" occurs at 5–14 years of age; of the 13 cases diagnosed as

[8] Rates of cataract for Levy County, Fla., for both sexes are: white, 12.1, and Negro, 20.7 percent.

definite trachoma in Pope County, Ark., 7 occurred between the ages of 5 and 14 years. Veldee found the age of maximum prevalence of folliculosis to be 5-6 years of age with a rapid decline thereafter in contrast to trachoma which persists into adult life.

TABLE 10.—*Prevalence of certain eye diseases among white persons in specific age groups—members of Farm Security Administration borrower families, 1940*

Age	Number of persons examined in			Cataract (Levy County, Fla.)	Strabismus (11 localities)[1]	Trachoma and suspected trachoma[3] (Pope County, Ark.)	Pterygium (11 localities)[1]
	11 localities[1]	Florida	Arkansas[3]	Percent			
All ages	5,905	593	745	12.1	2.7	9.0	2.1
Under 5	733	71	88		1.0	5.7	
5-14	1,837	136	246		2.9	14.2	4
15-24	991	112	131	9	2.7	9.9	6
25-34	663	75	87		2.4	5.7	1.1
35-44	726	73	107	8.2	4.3	3.7	4.5
45-54	581	68	58	29.4	2.9	5.2	6.7
55-64	268	42	23	76.2	1.9	8.7	6.7
65 and over	106	16	5	81.3	1.9		13.2

[1] The 11 localities are as given in table 9, note 2.
[2] Of the total 88 cases of cataract 72, or 82 percent, occurred in Levy County, Fla.
[3] Of the total 70 cases of trachoma 67, or 93 percent, occurred in Pope County, Ark. The total of 67 cases includes 13 diagnosed as definite trachoma, the remaining 54 cases were diagnosed as suspected trachoma recommended for observation. The ages of the reported trachoma cases are: 2, under 5, 7, 5-14, 1, 15-24, 1, 25-34, and 2, 35-44.

SUMMARY

In connection with a rehabilitation program for borrower families the Farm Security Administration organized clinics and conducted general physical examinations of practically all members of borrower families in 19 selected localities from November 1939 through November 1940. The examinations were made by a staff of physicians and technicians. The examined population was almost entirely native white and Negro residing in 11 Southern States and 6 Northern or intermediate States. The families represent a low income farm population of the United States.

Curves of the age prevalence of defective vision as determined by the Snellen test are presented for this selected group and compared with other available data. The relative age prevalence of defective vision among rural rehabilitation farmers agrees with that of farmers examined by the Life Extension Institute, and differs from that of urban groups examined in a less rapid rate of increase in young adult ages and a more rapid rate of increase between 40 and 50 years of age. With respect to the actual value of recorded prevalence rates, the Farm Security Administration borrower families have less defective vision as determined by the Snellen test than available examined urban groups especially between the ages of 20 and 45 years; they also com-

pare somewhat unfavorably with another examined agricultural group but it is impossible to say how much of this difference might be due to differences in group selection and examining procedure.

Sex and color comparisons show that females have a higher percentage of defective vision than males for every age group; Negroes in these data have less defective vision than whites for all age groups.

Acknowledgment.- The authors wish to make acknowledgment to Dr. S. D. Collins for critical suggestions, advice, and guidance throughout the preparation of these studies; to Dr. R. C. Williams who was Chief Medical Officer of the Farm Security Administration in charge of the health program conducted among rural rehabilitation farmers; to Dr. F. D. Mott, Dr. B. A. Dyar, Dr. Thomas E. Morgan, Dr. F. V. Meriwether, and Dr. J. T. Googe who supervised the setting up of the physical examination procedure in the various localities; and to the members of the several professional staffs who made the physical examinations.

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PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 2, 1944

Summary

The increase during the week in the incidence of poliomyelitis is less than that for either of the 2 preceding weeks. A total of 1,683 cases was reported, as compared with 1,529 and 1,254 for the preceding week and the next earlier week, respectively, and 1,370 for the corresponding week of 1931, which was the largest number reported for any week in prior years for which weekly records are available (i. e., since 1927).

The largest numbers, aggregating 1,423 cases, or approximately 85 percent of the total, were reported in the Middle Atlantic, East North Central, and South Atlantic areas. Sixteen States (6 showing decreases) reported 20 or more cases each, as follows (last week's figures in parentheses): *Increases* Connecticut 20 (19), New York 666 (581), New Jersey 67 (36), Pennsylvania 162 (139), Ohio 105 (97), Indiana 27 (16), Michigan 120 (94), Wisconsin 32 (26), Maryland 47 (40), Virginia 65 (63); *decreases* Massachusetts 35 (43), Illinois 37 (38), Minnesota 40 (57), District of Columbia 22 (27), North Carolina 42 (46), Kentucky 34 (38).

The total number of cases reported for the first 35 weeks of the year, ended September 2, is 9,472, as compared with 5,886 for the same period last year and a 5-year (1939-43) median of 3,301. In 14 of the past 17 years the peak of weekly incidence of poliomyelitis was reached earlier than September 20.

The number of cases of meningococcus meningitis reported for the week, 122, although more than 4 times the 5-year median of 29, is less than the number reported last week or for the corresponding week last year, 159 and 151, respectively. States reporting the largest numbers are New York (19), California (12), Pennsylvania (11), and Michigan (9).

Currently reported cases of diphtheria, smallpox, typhoid fever, and whooping cough are below both the reports for last week and the 5-year medians. The total of scarlet fever is below the 5-year median. While the figures for influenza and measles are less than for the preceding week, they are slightly above the medians.

A total of 7,591 deaths was recorded in 92 large cities of the United States, as compared with 7,446 last week and a 3-year (1941–43) average of 7,736. The total for the year to date is 318,961, as compared with 325,413 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Sept. 2, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria, Week ended Sept. 2, 1944	Diphtheria, Week ended Sept. 4, 1943	Diphtheria, Median 1939-43	Influenza, Week ended Sept. 2, 1944	Influenza, Week ended Sept. 4, 1943	Influenza, Median 1939-43	Measles, Week ended Sept. 2, 1944	Measles, Week ended Sept. 4, 1943	Measles, Median 1939-43	Meningitis, meningococcus, Week ended Sept. 2, 1944	Meningitis, meningococcus, Week ended Sept. 4, 1943	Meningitis, meningococcus, Median 1939-43
NEW ENGLAND												
Maine	0	0	0	----	0	----	9	11	11	0	2	0
New Hampshire	0	0	0	----	0	----	0	0	0	1	0	0
Vermont	0	1	0	----	0	----	2	1	3	0	0	0
Massachusetts	4	0	1	----	0	----	26	24	38	4	4	1
Rhode Island	2	0	0	----	0	----	1	8	5	1	3	0
Connecticut	1	1	0	2	0	----	11	9	11	5	4	0
MIDDLE ATLANTIC												
New York	6	5	8	[1] 1	[1] 2	[1] 2	50	100	57	19	19	2
New Jersey	0	2	2	1	2	2	12	65	20	8	1	1
Pennsylvania	8	3	4	----	0	----	21	30	39	11	14	2
EAST NORTH CENTRAL												
Ohio	2	5	5	5	0	4	8	27	24	8	8	1
Indiana	8	8	8		12	4	2	1	1	0	1	1
Illinois	4	5	10	1	3	3	7	22	10	6	12	2
Michigan [2]	5	6	6	1	1	1	4	86	16	9	13	1
Wisconsin	2	2	0	2	11	11	113	93	43	2	1	1
WEST NORTH CENTRAL												
Minnesota	0	3	2	----	0	1	3	16	5	1	2	0
Iowa	2	5	2	----	0	----	3	2	10	0	1	0
Missouri	1	0	3		1	----	4	9	4	5	5	2
North Dakota	3	1	1	5	13	1	3	13	3	3	1	0
South Dakota	2	2	2		0	----	0	7	3	0	0	0
Nebraska	2	4	0	----	0	----	1	0	2	1	0	0
Kansas	5	2	3		0	----	4	5	8	0	1	0
SOUTH ATLANTIC												
Delaware	0	1	0		0		0	0	0	1	1	0
Maryland [2]	5	1	1	----	1	2	9	17	7	0	0	1
District of Columbia	0	0	1		0		1	3	3	0	2	0
Virginia	6	5	5	21	30	30	5	7	7	1	0	1
West Virginia	2	5	5	1	0	1	2	9	3	1	2	2
North Carolina	3	27	32	5	0		12	10	10	5	4	1
South Carolina	11	9	9	64	152	90	5	4	4	0	1	1
Georgia	12	0	13	52	5	18	13	7	6	0	0	0
Florida	7	6	3	1	11	4	72	0	4	2	4	0
EAST SOUTH CENTRAL												
Kentucky	9	7	7	1	2	2	2	10	8	5	3	1
Tennessee	5	3	6	6	2	4	1	8	6	1	1	1
Alabama	6	6	12	12	16	6	3	5	16	2	5	1
Mississippi [2]	10	12	12		0	----				1	0	0
WEST SOUTH CENTRAL												
Arkansas	4	0	7	10	1	2	6	6	4	1	1	0
Louisiana	4	2	2		1	1	0	0	1	1	2	1
Oklahoma	5	1	5	7	11	5	10	11	2	0	2	0
Texas	15	18	22	216	226	108	28	46	29	2	6	2
MOUNTAIN												
Montana	15	0	2	----	0		0	21	10	0	0	0
Idaho	0	0	0		0		0	1	1	0	0	0
Wyoming	0	0	0		0	1	0	4	3	0	0	0
Colorado	4	14	4	27	11	5	0	14	14	0	0	0
New Mexico	5	1	1	----	2		2	4	4	0	0	0
Arizona	0	0	0	12	35	30	2	4	4	0	0	0
Utah	0	0	0	----	1	1	7	2	4	0	0	0
Nevada	0	0	0	1	0	0	4	0	0	0	1	0
PACIFIC												
Washington	5	1	1	1	1	----	32	17	17	3	5	0
Oregon	0	6	1	5	2	3	18	12	12	1	5	1
California	15	18	10	28	10	11	150	54	54	12	14	0
Total	205	198	243	491	565	388	668	808	666	123	151	29
35 weeks	7,189	7,696	8,074	339,669	82,813	152,280	592,322	539,146	467,858	13,371	13,845	1,470

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended Sept 2, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939 43	Week ended—		Median 1939 43
	Sept 2 1944	Sept 4 1943		Sept 2 1944	Sept 4 1943		Sept 2 1944	Sept 4 1943		Sept 2 1944	Sept 4 1943	
NEW ENGLAND												
Maine	1	1	1	10	13	1	0	0	0	0	1	2
New Hampshire	11	1	0	0	2	2	0	0	0	0	1	0
Vermont	7	0	0	0	1	1	0	0	0	1	0	0
Massachusetts	35	20	3	32	47	47	0	0	0	2	2	4
Rhode Island	1	11	1	2	4	3	0	0	0	1	0	0
Connecticut	20	44	5	10	8	7	0	0	0	2	1	4
MIDDLE ATLANTIC												
New York	666	58	[illegible]	[illegible]	66	52	0	0	0	16	13	12
New Jersey	67	9	10	15	14	19	0	0	0	3	5	4
Pennsylvania	162	5	13	34	41	42	0	0	0	3	18	18
EAST NORTH CENTRAL												
Ohio	105	18	18	[illegible]	66	46	0	1	0	13	14	12
Indiana	27	3	6	11	11	11	0	0	0	4	1	6
Illinois	37	192	31	18	53	53	0	[illegible]	1	3	6	10
Michigan [2]	120	18	26	[illegible]	42	41	0	0	0	2	6	9
Wisconsin	32	18	7	27	35	35	0	0	0	2	1	1
WEST NORTH CENTRAL												
Minnesota	40	11	11	11	22	[illegible]	0	0	0	0	0	0
Iowa	7	33	2	6	13	13	0	0	0	1	2	2
Missouri	11	30	5	11	8	11	0	0	0	11	3	9
North Dakota	4	2	1	2	2	2	0	0	0	1	0	0
South Dakota	0	0	1	0	11	9	0	0	0	1	0	0
Nebraska	7	17	2	7	3	3	0	0	0	0	0	1
Kansas	8	90	5	23	18	20	0	0	0	5		4
SOUTH ATLANTIC												
Delaware	4	3	0	2	1	1	0	0	0	0	0	1
Maryland [2]	47	0	1	14	11	9	0	0	0	2	0	5
District of Columbia	22	0	0	2	2	4	0	0	0	0	3	2
Virginia	[illegible]	0	1	11	8		0	0	0		2	6
West Virginia	11	0	2	[illegible]	27	11	0	0	0	4	1	9
North Carolina	42	3	3	27	[illegible]	23	0	0	0	7	1	11
South Carolina	4	1	1	2	9	4	0	0	0	2	4	6
Georgia	8	1	2	6	12	12	2	0	0	6	8	18
Florida	2	0	3	1	1	2	0	0	0	2	0	3
EAST SOUTH CENTRAL												
Kentucky	34	10	10	13	14	17	0	0	0		8	[illegible]
Tennessee	5	2	4	9	23	10	0	0	0	1	[illegible]	[illegible]
Alabama	2	0	3	[illegible]	21	20	0	0	0	1	5	6
Mississippi [2]	7	2	2	7	6	[illegible]	0	0	0	3	11	11
WEST SOUTH CENTRAL												
Arkansas	3	1	2	3	3	4	0	0	0	9		9
Louisiana	1	1	1	1	0	2	0	0	0	1	4	13
Oklahoma	2	[illegible]	2	3	[illegible]	8	0	0	0	3		13
Texas	8	62	8	20	[illegible]	18	0	0	0	[illegible]	11	[illegible]
MOUNTAIN												
Montana	0	9	3	4	11	9	0	0	0	0	0	2
Idaho	1	0	1	3	2	2	0	0	0	0	1	1
Wyoming	0	5	0	0	[illegible]	1	0	0	0	0	0	1
Colorado	5	20	1	10	10		0	0	0	0	2	2
New Mexico	1	12	[illegible]	3	4	1	0	0	0	2	0	4
Arizona	1	1	2	1	2	1	0	0	0	3	3	2
Utah [2]	2	76	3	4	9	2	0	0	0	0	0	1
Nevada	2	0	0	0	[illegible]	0	0	0	0	0	0	0
PACIFIC												
Washington	12	19	2	21	14	8	0	0	0	0	5	3
Oregon	11	16	3	7	7	6	0	0	1	2	1	1
California	10	114	13	87	58	39	0	0	0	1	1	7
Total	1 682	956	606	[illegible]	821	683	2	7	7	149	169	345
35 weeks	9 474	5 886	3 301	148 893	99 317	99 317	305	616	1 192	3 506	3 655	5 181

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever reported separately as follows Massachusetts 1, Rhode Island 1 Connecticut 2, New York 6, Illinois 1, Georgia 1, Arkansas 2, Texas 2

Telegraphic morbidity reports from State health officers for the week ended Sept. 2, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough: Week ended— Sept 2 1944	Whooping cough: Week ended— Sept 4, 1943	Whooping cough: Median 1939 43	Week ended September 2 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	20	16	19	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	9	23	23	0	0	0	0	0	0	0	0	0
Massachusetts	69	37	110	0	0	4	0	0	0	0	0	0
Rhode Island	6	6	10	0	0	0	0	0	0	0	0	0
Connecticut	30	7	38	0	0	4	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	183	258	264	0	3	73	0	5	0	1	0	1
New Jersey	61	157	98	1	0	3	0	1	0	0	0	0
Pennsylvania	79	133	192	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	113	123	209	0	0	0	0	0	0	0	0	0
Indiana	2	27	27	0	0	0	0	0	0	1	1	0
Illinois	68	156	201	0	0	5	0	2	0	0	0	0
Michigan [2]	61	221	221	0	2	7	0	0	0	0	0	0
Wisconsin	120	208	208	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	41	50	35	0	3	0	0	2	0	0	0	0
Iowa	10	73	23	0	0	0	0	0	0	0	0	0
Missouri	16	13	8	0	0	0	1	0	0	0	2	0
North Dakota	39	42	13	0	0	0	0	17	0	0	0	0
South Dakota	1	12	6	0	0	0	0	0	0	0	0	0
Nebraska	3	9	3	0	0	0	0	0	0	0	0	0
Kansas	38	31	32	0	0	0	0	1	0	0	1	0
SOUTH ATLANTIC												
Delaware	0	7	4	0	0	0	0	0	0	0	0	0
Maryland [2]	46	55	56	0	0	0	8	0	0	1	0	0
District of Columbia	0	24	15	0	0	0	0	0	0	0	0	0
Virginia	23	23	22	0	0	0	150	0	0	3	0	1
West Virginia	12	57	17	0	0	0	0	0	0	0	0	0
North Carolina	95	100	100	0	0	0	0	0	0	2	1	7
South Carolina	70	58	18	0	0	8	0	0	0	0	0	5
Georgia	2	13	17	0	0	6	0	0	0	0	1	25
Florida	19	19	11	0	0	0	0	0	0	0	0	10
EAST SOUTH CENTRAL												
Kentucky	34	23	27	0	0	0	0	0	0	0	0	0
Tennessee	15	27	27	0	0	0	0	0	0	0	0	1
Alabama	6	18	18	0	0	0	0	0	0	0	0	17
Mississippi [2]				0	0	0	0	0	0	0	0	7
WEST SOUTH CENTRAL												
Arkansas	8	14	13	0	1	70	0	0	0	0	0	0
Louisiana	1	6	6	0	0	0	0	0	0	0	0	7
Oklahoma	7	2	4	0	0	0	8	0	0	0	0	0
Texas	170	139	139	0	21	426	16	3	0	0	1	65
MOUNTAIN												
Montana	21	17	17	0	0	0	0	1	0	0	0	0
Idaho	1	0	1	0	0	0	0	1	0	0	0	0
Wyoming	1	1	3	0	0	0	0	0	0	0	2	0
Colorado	34	32	20	0	1	0	0	5	0	0	0	0
New Mexico	0	9	8	0	0	3	2	0	0	0	0	0
Arizona	26	13	7	0	0	0	33	0	0	0	0	0
Utah [2]	24	60	39	0	0	0	0	0	0	0	1	0
Nevada	0	2	0	0	0	0	0	0	0	0	1	0
PACIFIC												
Washington	19	64	36	0	0	0	0	0	0	0	0	0
Oregon	4	46	19	0	0	0	0	0	0	0	0	0
California	74	135	135	0	8	8	0	3	0	0	0	2
Total	1 690	2 536	2 536	1	39	617	218	41	0	8	11	157
Same week 1943	2 536			2	30	447	252	25	1	16	6	128
Same week 1942	2 894			2	32	217	161	21	0	10	8	126
35 Weeks 1944	66 648			31	1,179	15 160	5 640	442	20	389	397	3,091
35 Weeks 1943	137 429			44	1 435	11 096	5 230	475	19	381	615	2,409
35 Weeks 1942	128 043		[4] 131 769	60	772	6 059	4 700	361	35	[4] 399	676	[4] 1,734

[2] Period ended earlier than Saturday

[4] 5 year median

WEEKLY REPORTS FROM CITIES

City reports for week ended August 19, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	-	0	0	0	0	0	0	0	0	0
New Hampshire:												
Concord	0	0		0	1	0	2	0	0	0	0	0
Massachusetts:												
Boston	1	0		0	26	6	9	3	13	0	0	6
Fall River	0	0		0	0	0	0	0	0	0	0	5
Springfield	0	0	1	1	3	3	2	2	1	0	0	0
Worcester	0	0		0	0	0	2	0	3	0	1	1
Rhode Island:												
Providence	0	0	--	0	0	0	1	0	1	0	0	
Connecticut:												
Bridgeport	0	0	-	0	0	0	2	3	0	0	0	3
Hartford	0	0		0	0	0	0	1	1	0	0	4
New Haven	0	0	1	0	0	0	0	1	0	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	0	1	3	79	1	0	2	0
New York	4	0	2	3	15	16	66	129	18	0	13	59
Rochester	0	0		0	6	1	0	8	0	0	0	5
Syracuse	0	0		0	1	2	0	11	0	0	0	12
New Jersey:												
Camden	0	0		0	1	0	0	0	1	0	0	0
Newark	0	6	1	0	5	0	1	6	0	0	0	7
Trenton	0	0		0	0	0	4	0	0	0	0	0
Pennsylvania:												
Philadelphia	1	0	3	2	3	2	11	31	8	0	1	8
Pittsburgh	0	0		0	0	6	5	10	3	0	0	5
Reading	0	0		0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0		0	0	2	2	7	8	0	0	10
Cleveland	1	0		0	0	2	4	25	2	0	0	35
Columbus	0	0		0	3	0	1	0	2	0	0	17
Indiana:												
Fort Wayne	0	0		0	0	0	1	1	1	0	0	0
Indianapolis	1	0		0	1	1	2	2	2	0	0	4
South Bend	0	0		0	0	0	0	0	0	0	0	0
Terre Haute	0	0		0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	1	0	1	1	9	3	24	12	10	0	2	47
Springfield	0	0		0	0	0	2	0	3	0	0	0
Michigan:												
Detroit	3	0	1	0	8	0	11	33	5	0	1	38
Flint	0	0		0	0	0	6	1	0	0	0	4
Grand Rapids	0	0		0	0	0	1	0	0	0	1	6
Wisconsin:												
Kenosha	1	0		0	0	0	0	0	0	0	0	11
Milwaukee	0	0		0	12	1	0	3	1	0	0	31
Racine	0	0		0	5	0	1	0	0	0	0	6
Superior	0	0		0	5	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	0	0	1	6	0	0	0	9
Minneapolis	1	0		0	0	0	2	11	2	0	0	3
St. Paul	1	0		0	1	1	2	8	0	0	0	26
Missouri:												
Kansas City	0	0		0	1	1	4	1	1	0	1	0
St. Joseph	0	0		0	0	0	0	0	2	0	0	0
St. Louis	1	0	1	1	18	3	8	3	1	0	0	12

City reports for week ended August 19, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota												
Fargo	0	0		0	0	0	1	4	0	0	0	0
Kansas												
Topeka	0	0		0	0	0	0	0	0	0	0	8
Wichita	0	0		0	0	0	4	0	0	0	0	1
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	1	4	0	0	0	1
Maryland												
Baltimore	4	0		0	1	2	10	14	6	0	0	54
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		0	4	0	6	19	4	0	0	7
Virginia												
Lynchburg	0	0		0	0	0	0	13	1	0	0	1
Richmond	0	0		0	2	0	0	1	1	0	0	2
Roanoke	0	0		0	0	0	0	5	0	0	0	2
West Virginia												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	1	0	2	1	1	0	0	[illegible]
North Carolina												
Raleigh	0	0		0	0	0	0	2	0	0	0	4
Wilmington	0	0		0	0	0	3	0	1			13
Winston-Salem	0	0		0	0	0	0	3	0	0	0	7
South Carolina												
Charleston	0	0		0	0	0	1	0	0	0	1	0
Georgia												
Atlanta	0	0	5	0	2	1	3	0	2	0	1	3
Brunswick	0	0		0	0	0	0	0	0	0	0	0
Savannah	0	0		0	0	0	1	0	0	0	1	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	0	0		0	1	0	8	1	0	0	1	14
Nashville	0	0		0	4	0	3	0	0	0	0	0
Alabama												
Birmingham	1	0	1	0	0	1	2	2	1	0	0	0
Mobile	0	0		0	1	0	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	0	0	0	0	0	9
Louisiana												
New Orleans	0	0	1	0	0	0	5	4	0	0	0	0
Shreveport	0	0		0	0	0	5	0	0	0	1	0
Texas												
Dallas	1	0		0	1	0	1	0	1	0	0	8
Galveston	0	0		0	0	0	0	0	0	0	0	0
Houston	2	0		0	0	0	3	0	1	0	6	1
San Antonio	1	0	1	0	0	0	2	0	0	0	1	1
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	0	0	0	3
Great Falls	0	0		0	0	0	1	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	3
Missoula	0	0		0	0	0	0	0	0	0	0	0
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	1	0		0	0	1	7	1	3	0	0	16
Pueblo	0	0		0	0	0	3	0	0	0	0	0
Utah												
Salt Lake City	0	0		0	6	0	1	0	2	0	0	8

City reports for week ended August 19, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington												
Seattle	0	0		0	2	0	3	5	1	0	0	0
Spokane	0	0		0	0	0	0	1	2	0	0	0
Tacoma	0	0		0	4	0	2	2	0	0	0	4
California												
Los Angeles	5	0	3	0	15	4	0	2	5	0	0	5
Sacramento	1	2		0	7	0	3	0	3	0	0	3
San Francisco	0	0		0	24	1	4	0	8	0	0	0
Total	34	3	21	8	199	61	268	481	137	0	34	562
Corresponding week, 1943	38		21	5	367		222		285	0	34	1033
Average, 1939-43	44		27	[1] 8	[2] 270		[1] 216		188	1	43	1123

[1] 3 year average, 1941-43
[2] 5 year median.

Anthrax—Cases: Houston, 1
Dysentery, amebic—Cases: Boston, 1, Chicago, 1, Houston, 1
Dysentery, bacillary—Cases: Providence, 3, New Haven, 2, New York, 1, Syracuse, 2, Philadelphia, 1, Pittsburgh, 1, Chicago, 1, Detroit, 6, Baltimore, 1, Richmond, 1, Charleston, S. C., 1, Memphis, 1, Nashville, 2, Los Angeles, 6
Dysentery, unspecified—Cases: Cleveland, 1, Baltimore, 1, Richmond, 3, Sacramento, 2
Leprosy—Cases: New Orleans, 2
Rocky Mountain spotted fever—Cases: St. Louis, 1, Richmond, 1
Tularemia—Cases: Richmond, 1
Typhus fever, endemic—Cases: Atlanta, 2, Savannah, 12, Nashville, 5, Birmingham, 4, Mobile, 10, New Orleans, 10, Houston, 11, San Antonio, 9, Wilmington, N. C., 10

***Rates** (annual basis) per 100,000 population, by geographic groups, for the 8[illegible] cities in the preceding table (estimated population, 1943, 34,052,500)*

	Diphtheria case rates	Encephalitis, infectious case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.6	2.6	2.6	2.6	79	23.6	47.3	26.3	55	0.0	2.6	76
Middle Atlantic	2.3	0.0	2.8	2.3	14	13.0	41.7	126.8	14	0.0	7.4	44
East North Central	5.5	0.0	1.2	0.6	26	5.5	33.4	51.1	21	0.0	2.4	127
West North Central	6.5	0.0	2.2	2.2	43	10.8	47.7	71.5	13	0.0	2.2	128
South Atlantic	6.8	0.0	8.5	0.0	17	5.1	45.8	105.2	29	0.0	5.1	168
East South Central	6.0	0.0	6.0	0.0	35	6.0	88.5	17.7	6	0.0	6.0	83
West South Central	11.5	0.0	5.7	0.0	3	0.0	45.9	11.5	6	0.0	23.0	55
Mountain	7.9	0.0	0.0	0.0	48	7.9	103.3	7.9	40	0.0	0.0	199
Pacific	9.5	3.2	4.8	0.0	82	7.9	19.0	15.8	30	0.0	0.0	19
Total	5.2	0.5	3.2	1.2	31	9.4	41.1	73.9	21	0.0	5.2	86

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—Two rats found in Honokaa, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague on July 11, 1944 and August 2, 1944, respectively. One mouse found in the same place was proved positive for plague on July 18, 1944.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 5, 1944.—During the week ended August 5, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		11	1	6	64	11	10	24	20	147
Diphtheria		8	1	16	2	1	1	17		49
Dysentery (bacillary)				2						2
German measles				3	16		2	4	14	39
Influenza					3				3	6
Measles		5	1	53	70	18	16	60	9	232
Meningitis, meningococcus				3	3				1	7
Mumps				35	26	7	10	27	5	110
Poliomyelitis			4	2	[1] 12	2	1	7		[1] 28
Scarlet fever		3	5	16	38	17	8	28	6	121
Tuberculosis (all forms)		1	11	141	54	10			24	241
Typhoid and paratyphoid fever				3	6		1			10
Undulant fever				4	1				1	6
Whooping cough		21		69	39	8	3	8	25	173

[1] Includes 3 cases in delayed reports.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

India—Bihar Province.—Information dated August 10, 1944, states that according to newspaper reports a serious outbreak of cholera has appeared in Bihar Province, India. No reliable statistics are available.

Plague

Egypt—Port Said.—For the week ended August 12, 1944, 5 cases of plague with 2 deaths were reported in Port Said, Egypt.

French West Africa—Dakar.—For the period August 1–7, 1944, 38 cases of plague with 27 deaths were reported in Dakar, French West Africa.

Senegal.—For the period July 11 20, 1944, 8 deaths from plague were reported in Senegal.

Smallpox

Brazil—Sao Paulo State—Santos.— Smallpox has been reported in Santos, Sao Paulo State, Brazil, as follows: Weeks ended—July 1, 1944, 7 cases, July 8, 9 cases, July 15, 2 cases, July 22, 23 cases, July 29, 58 cases, August 5, 32 cases, August 12, 19 cases.

British East Africa.—For the week ended July 22, 1944, smallpox was reported in British East Africa, as follows: Tanganyika Territory, 305 cases; Uganda, 116 cases, 1 death.

Nigeria.—For the week ended July 22, 1944, 113 cases of smallpox with 15 deaths were reported in Nigeria.

Peru.— For the month of June 1944, 25 cases of smallpox were reported in Peru, including 11 cases in Huancavelica Department and 5 cases in Puno Department.

Venezuela. For the month of July 1944, 41 cases of smallpox with 2 deaths were reported in Venezuela including 37 cases with 2 deaths reported in Caracas For the week ended August 19, 1944, 7 cases of smallpox were reported in Falcon State and 7 cases in Miranda State, Venezuela.

Typhus Fever

Chile. For the 4 weeks ended July 15, 1944, 90 cases of typhus fever with 12 deaths were reported in Chile, including 63 cases with 11 deaths reported in Chiloe Province, 2 cases in Antofagasta, 8 cases in Santiago, 9 cases in Talcahuano, and 5 cases in Valparaiso.

Colombia. Typhus fever has been reported in Sonson, Antioquia Department, Colombia, by months, as follows: January 1944, 7 cases, 1 death; February, 21 cases, 1 death; March, 54 cases, 2 deaths; April, 70 cases, 4 deaths; May, 72 cases, 1 death; June, 26 cases, 1 death; July, 7 cases.

Egypt. For the week ended July 22, 1944, 172 cases of typhus fever with 34 deaths were reported in Egypt.

Guatemala. For the month of July 1944, 175 cases of typhus fever with 17 deaths were reported in Guatemala, including 21 cases in El Quiche Department, 40 cases in Alta Verapaz Department, 29 cases with 5 deaths in Quezaltenango Department, and 27 cases with 4 deaths in San Marcos Department.

Hungary.- For the week ended July 29, 1944, 56 cases of typhus fever (22 in Subcarpathia) were reported in Hungary

Peru. –For the month of June 1944, 170 cases of typhus fever were reported in Peru, including 30 cases in Ancash Department, 18 cases in Cuzco Department, and 27 cases in Huanuco Department.

Rumania. For the period April 24–30, 1944, 381 cases of typhus

fever were reported in Rumania; for the period May 1-7, 1944, 441 cases were reported.

Venezuela.—For the month of July 1944, 11 cases of typhus fever were reported in Venezuela.

Yugoslavia.—For the period July 1-14, 1944, 348 cases of typhus fever (43 cases in Brod, 99 cases in Travnik, and 99 cases in Tuzia) were reported in Yugoslavia.

Yellow Fever

Belgian Congo Coquilhatville Province—Banzyville—On June 26, 1944, 1 death from yellow fever was reported in Banzyville, Coquilhatville Province, Belgian Congo. For the period August 12–17, 1944, 10 cases of suspected yellow fever were reported in the same locality.

* * *

INCIDENCE OF HOSPITALIZATION, JULY 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities

Item	July 1943	July 1944
1 Number of plans supplying data	72	73
2 Number of persons eligible for hospital care	11,076,738	13,664,738
3 Number of persons admitted for hospital care	107,693	129,769
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	114 4	112 2
5 Incidence per 1,000 persons, annual rate for the 12 months ended July 31.	105 5	104 8

DEATHS DURING WEEK ENDED AUGUST 26, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census Department of Commerce]

	Week ended Aug 26, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths.	7,472	7,856
Average for 3 prior years	7,509	
Total deaths, first 34 weeks of year	312,399	318,561
Deaths under 1 year of age	601	657
Average for 3 prior years	610	
Deaths under 1 year of age, first 34 weeks of year	21,073	22,876
Data from industrial insurance companies		
Policies in force	66,705,582	65,764,051
Number of death claims	12,097	10,974
Death claims per 1,000 policies in force, annual rate.	9 5	8 7
Death claims per 1,000 policies, first 34 weeks of year, annual rate	10 2	10 0

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

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Public Health Reports

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Public Health Reports

Vol. 59 • SEPTEMBER 15, 1944 • *No. 37*

DIRECTORY OF FULL-TIME LOCAL HEALTH OFFICERS, 1943

This directory of full-time local health officers has been compiled from data as of June 30, 1943, furnished by the State health officers A full-time health officer is one who does not engage in the private practice of medicine, and devotes all his time, energies, and activities to his duties as health officer

Tabulations are presented for five distinct classifications of local health jurisdictions Prime numerals appearing after the names of the health units indicate the type of jurisdiction, as follows 1, county, 2, city, 3, city-county, 4, State district, 5, local district

A city-county unit denotes a county with a civil subdivision having a population of 10,000 or greater which contributes to the support of the unit

For the purposes of this directory, a district unit comprises two or more counties supervised by one health officer either through formal organization or through temporary arrangement to meet the shortage in medical personnel If the responsibility for operation is vested in the State or if State health department personnel administer the program of the unit, it is designated a "State district" If, however, control is vested in local authority, it has been checked as a "local district"

Local health unit	Name of health officer	Post office address	Official title
Alabama			
Autauga [1]	Temporary vacancy	Prattville	County health officer
Barbour [1]	G O Wallace M D	Clayton	Do
Blount [1]	I M Towns M D	Oneonta	Do
Bullock [1]	C W McDonald M D	Union Springs	Do
Cherokee [1]	S C Tatum M D	Center	Do
Chilton [1]	Temporary vacancy	Clanton	Do
Clarke [1]	Caroline H Callison M D	Grove Hill	Do
Cleburne [1]	J L Dorough M D	Heflin	Do
Colbert [1]	R E Harper M D	Tuscumbia	Do
Conecuh [1]	F I Kelly M D	Evergreen	Do
Covington [1]	C D McLeod M D	Andalusia	Do
Crenshaw [1]	J O Foster M D	Luverne	Do
Cullman [1]	M S Whiteside M D	Cullman	Do
Dale [1]	W L Orr, M D	Ozark	Do
Dallas [1]	L T Lee M D	Selma	Do
Franklin [1]	N P Underwood, M D	Russellville	Do
Hale [1]	I N Jones M D	Greensboro	Do
Henry [1]	R H Allen M D	Abbeville	Do
Houston [1]	W T Burkett M D	Dothan	Do
Jefferson [1]	George A Denison M D	Birmingham	Do
Lamar [1]	H A McClure, M D	Vernon	Do

Local health unit	Name of health officer	Post office address	Official title
Alabama—Continued.			
Lauderdale [1]	Temporary vacancy	Florence	County health officer.
Limestone [1]	F. M. Hall, M. D., C. P. H.	Athens	Do.
Macon [1]	Murray Smith, M. D.	Tuskegee	Do.
Madison [1]	W. C. Hatchett, M. D.	Huntsville	Do.
Marengo [1]	C. E. Kimbrough, M. D.	Linden	Acting county health officer.
Marion [1]	H. C. McRee, M. D.	Hamilton	County health officer.
Marshall [1]	Lee Weathington, M. D.	Guntersville	Do.
Mobile [1]	O. L. Chason, M. D., M. P. H., D. P. H.	Mobile	Do.
Monroe [1]	Temporary vacancy	Monroeville	Do.
Montgomery [1]	J. L. Bowman, M. D.	Montgomery	Do.
Pike [1]	W. H. Abernethy, M. D.	Troy	Do.
Russell [1]	R. W. Todd, M. D., D. P. H.	Phoenix City	Do.
Shelby [1]	E. F. Sloan, M. D.	Columbiana	Do.
St. Clair [1]	Juanita Bolton McDonald, M. D.	Ashville	Do.
Talladega [1]	J. H. Hill, M. D.	Talladega	Do.
Tallapoosa [1]	L. H. Hamner, M. D.	Dadeville	Do.
Tuscaloosa [1]	C. J. Fisher, M. D., M. P. H.	Tuscaloosa	Do.
Walker [1]	A. M. Waldrop, M. D.	Jasper	Do.
Wilcox [1]	E. L. McIntosh, M. D.	Camden	Do.
Winston [1]	J. I. Mitchell, M. D.	Double Springs	Do.
District [5]	W. Bruce Nelson, M. D.	Bay Minette	Do.
Baldwin			
Escambia			
District [5]	J. R. Long, M. D.	Centerville	Do.
Bibb			
Perry			
District [5]	E. F. Leatherwood, M. D.	Greenville	Do.
Butler			
Lowndes			
District [5]	J. E. Dunn, M. D.	Anniston	Do.
Calhoun			
Etowah			
District [5]	A. H. Graham, M. D., D. P. H.	LaFayette	Do.
Chambers			
Lee			
District [5]	T. M. Littlepage, M. D.	Butler	Do.
Choctaw			
Washington			
District [5]	M. L. Shaddix, M. D.	Ashland	Do.
Clay			
Randolph			
District [5]	G. L. Weidner, M. D., C. P. H.	Elba	Do.
Coffee			
Geneva			
District [5]	C. S. Cotlin, Jr., M. D., C. P. H.	Rockford	Do.
Coosa			
Elmore			
District [5]	E. N. Haller, M. D.	Fort Payne	Do.
DeKalb			
Jackson			
District [5]	J. H. Ashcraft, M. D.	Fayette	Do.
Fayette			
Pickens			
District [5]	E. M. Moore, M. D.	Eutaw	Do.
Greene			
Sumter			
District [5]	L. R. Murphree, M. D., C. P. H.	Moulton	Do.
Lawrence			
Morgan			
Arizona			
Cochise [3]	O. B. Moon, M. D.	Bisbee	Director.
Coconino [3]	Judson D. Dowling, M. D. (U. S. Public Health Service).	Flagstaff	Do.
Maricopa [3]	H. L. McMartin, M. D.	Phoenix	Do.
Pima [3]	Lewis H. Howard, M. D.	Tucson	Do.
Yuma [3]	R. R. Knotts, M. D.	Yuma	Do.
Arkansas:			
Crittenden [1]	B. M. Stevenson, M. D.	Marion	Local medical director.
Garland [3]	Temporary vacancy	Hot Springs	Do.
Jefferson [3]	W. H. Bruce, M. D.	Pine Bluff	Do.
Little Rock [3]	L. L. Fatherree, M. D., M. P. H.	Little Rock	City health officer.
Miller [3]	H. K. Abrams, M. D.	Texarkana	Local medical director.
Mississippi [1]	E. C. Budd, M. D.	Blytheville	Do.
Pulaski [1]	J. S. Summers, M. D.	Little Rock	Do.
St. Francis [1]	Alvin B. Caldwell, M. D.	Forrest City	Do.
Sebastian [3]	J. E. Johnson, M. D.	Fort Smith	Do.
District No. 1 [5]	Temporary vacancy	Monticello	District medical director.
Drew			
Bradley			
Cleveland			

Local health unit	Name of health officer	Post office address	Official title
Arkansas—Con			
District No 2 [5]	Temporary vacancy	Hamburg	District medical director
Ashley			
Chicot			
Desha			
District No 3 [5]	L B Jones M D	Arkadelphia	Do
Clark			
Nevada			
Hempstead			
District No 4 [5]	Temporary vacancy	Conway	Do
Faulkner			
Cleburne			
Van Buren			
District No 5 [5]	Temporary vacancy	Ashdown	Do
Little River			
Howard			
Sevier			
District No 6 [5]	Temporary vacancy	Fayetteville	Do
Washington			
Benton			
Madison			
District No 7 [5]	R C Kennerly M D	Camden	Do
Calhoun			
Dallas			
Ouachita			
District No 8 [5]	J T Herron M D	Helena	Do
Lee			
Monroe			
Phillips			
District No 9 [5]	A B Tate, M D	Russellville	Do
Conway			
Johnson			
Pope			
Yell			
District No 10 [5]	C S Pool M D	Malvern	Do
Grant			
Hot Spring			
Saline			
District No 11 [5]	J I Hays M D	Augusta	Do
Arkansas			
Cross			
Prairie			
Woodruff			
District No 12 [5]	Temporary vacancy	Walnut Ridge	Do
Clay			
Greene			
Lawrence			
Randolph			
District No 13 [5]	C I Seaman M D	Van Buren	Acting director
Crawford			
Franklin			
Logan			
District No 14 [5]	Temporary vacancy	Newport	Do
Jackson			
Independence			
White			
District No 15 [5]	Temporary vacancy	Harrison	Do
Boone			
Carroll			
Marion			
Newton			
District No 16 [5]	Temporary vacancy	Mount Ida	District medical director
Montgomery			
Pike			
Polk			
Scott			
District No 17 [5]	Temporary vacancy	Jonesboro	Do
Craighead			
Poinsett			
California			
Alameda [1]	Clifford V Mason M D	San Leandro	Health officer
Bakersfield [2]	Peter J Cuneo, M D	Bakersfield	Do
Berkeley [2]	Frank L Kelly, M D D P H	Berkeley	Do
Contra Costa [1]	William A Powell, M D	Martinez	Do
Fresno [2]	Earl H Coleman, M D	Fresno	Do
Fresno [1]	William F Stein, M D	do	Do
Imperial [1]	F B Godfrey M D	El Centro	Do
Kern [1]	J M Kirby, M D	Bakersfield	Do
Long Beach [2]	Frank L Stewart, M D	Long Beach	Do
Los Angeles [2]	George M Uhl, M D, M S P H	Los Angeles	Do
Los Angeles [1]	Hubert O Swartout, M D, D P H	do	Do
Madera [1]	Lee A Stone, M D	Madera	Do

Local health unit	Name of health officer	Post office address	Official title
California—Con			Health officer.
Marin [1]	Irving Johnson, M. D., M. P. H.	San Rafael	Do.
Monterey [2]	Kenneth C. Sheriff, M. D.	Salinas	Do.
Oakland [2]	Stanford F. Farnsworth, M. D., M. P. H.	Oakland	Do.
Orange [2]	Edward L. Russell, M. D.	Santa Ana	Do.
Palo Alto [2]	Louis Olson, A. B. (San Eng.)	Palo Alto	Do.
Pasadena [2]	Charles A. Arthur, Ph. B.	Pasadena	Do.
Richmond [2]	Charles R. Blake, M. D.	Richmond	Do.
Riverside [2]	Warren F. Fox, M. D.	Riverside	Do.
Sacramento [2]	Herbert F. True, M. D.	Sacramento	Do.
Sacramento [1]	Albert F. Zipf, M. D., M. P. H.	do	Do.
San Bernadino [2]	Walter W. Fenton, M. D.	San Bernadino	Do.
San Diego [2]	Alex M. Lesem, M. D.	San Diego	Do.
San Francisco [2]	Jacob C. Geiger, M. D., D. P. H.	San Francisco	Do.
San Joaquin [2]	John J. Skippy, M. D.	Stockton	District health officer.
San Jose [2]	Dwight M. Bissell, M. D., M. S. P. H.	San Jose	Health officer.
San Luis Obispo [1]	Harrison Eilers, M. D., M. S. P. H.	San Luis Obispo	Do.
San Mateo [2]	Charles C. Gans, M. D.	Redwood City	Do.
Santa Barbara [1]	John A. Carswell, M. D., D. P. H.	Santa Barbara	Do.
Santa Barbara [2]	Clarence R. Roome, M. D.	do	Do.
Santa Clara [1]	C. M. Burchfield, M. D.	San Jose	Do.
Santa Cruz [2]	John D. Fuller, M. D., M. S. P. H.	Santa Cruz	Do.
Solano [2]	Lester S. McLean, M. D.	Vallejo	Do.
Sonoma [1]	E. D. Barnett, M. D.	Santa Rosa	Do.
Stanislaus [2]	J. Lyle Spelmann, M. D.	Modesto	Do.
Tulare [1]	James C. Malcolm, M. D.	Visalia	Do.
Ventura [2]	Frank E. Gallison, M. D., M. P. H.	Ventura	Do.
Yolo [1]	John G. O'Hara, M. D.	Woodland	Do.
District [5]	J. Russell Frantz, M. D., M. P. H.	Marysville	Do.
Sutter			
Yuba			
Colorado			
Boulder [2]	H. L. Morency, D. V. M.	Boulder	City health officer.
El Paso [2]	M. F. Schafer, M. D.	Colorado Springs	Director.
Otero [1]	James T. Worrell, M. D.	La Junta	Do.
Pueblo [2]	William E. Buck, M. D.	Pueblo	City health officer.
Weld [1]	Lewis H. Hoyle, M. D., M. P. H.	Greeley	Director.
Connecticut:			
Bridgeport [2]	Richard O'B. Shea, M. D., M. P. H.	Bridgeport	Health officer.
Greenwich [2]	Thomas J. Bergin, M. D.	Greenwich	Do.
Hartford [2]	Alfred L. Burgdorf, M. D., M. P. H.	Hartford 4	Do.
Middletown [2]	Mario L. Palmieri, M. D., M. P. H.	Middletown	Do.
Milford [2]	George B. Davis, M. D., M. P. H.	Milford	Do.
New Britain [2]	Louis J. Dumot, M. D.	New Britain	Do.
New Haven [2]	Joseph I. Linde, M. D.	New Haven	Do.
New London [2]	Benjamin N. Pennell, D. V. S.	New London	Do.
Norwalk [2]	Robert E. Perdue, M. D.	Norwalk	Do.
Stamford [2]	Paul H. Brown, M. D., D. P. H.	Stamford	Do.
Waterbury [2]	Edward J. Godfrey, M. D., M. P. H.	Waterbury	Do.
West Hartford [2]	Charles E. McPartland, M. D.	West Hartford	Do.
Delaware			
Kent [4]	Ernest F. Smith, M. D.	Dover	Deputy State health officer.
New Castle [4]	John R. Downes, M. D.	Newark	Do.
Sussex [4]	Temporary vacancy	Georgetown	Do.
Wilmington [2]	James A. Dolce, M. D. (U. S. Public Health Service)	Wilmington	Health commissioner.
District of Columbia			
Washington [2]	George C. Ruhland, M. D.	Washington	Health officer.
Florida:			
Baker [1]	D. C. Witt, M. D.	Macclenny	Director.
Bay [1]	J. O. Barfield, M. D.	Panama City	Do.
Broward [1]	Otto W. Schwalb, M. D., M. P. H.	Fort Lauderdale	Do.
Dade [1]	T. E. Cato, M. D., M. P. H.	Miami 32	Do.
Duval [1]	K. K. Waering, M. D.	Jacksonville 2	Do.
Gadsen [1]	E. A. Cook, M. D.	Quincy	Do.
Hillsborough [1]	J. R. McEachern, M. D.	Tampa	Do.
Jefferson [1]	F. A. Brink, M. D.	Monticello	Do.
Lake [1]	Victor P. Genge, M. D.	Tavares	Do.
Leon [2]	L. J. Graves, M. D.	Tallahassee	Do.
Levy [1]	J. W. McMurray, M. D.	Bronson	Do.
Monroe [1]	J. B. Parramore, M. D.	Key West	Do.
Nassau [1]	George A. Dame, M. D.	Fernandina	Do.
Orange [1]	W. P. Rice, M. D.	Orlando	Do.
Pinellas [1]	R. D. Hollowell, M. D., M. P. H.	St. Petersburg	Do.
Polk [1]	Lawrence M. Zell, M. D.	Bartow	Do.
Seminole [1]	Leland H. Dame, M. D.	Sanford	Do.
Volusia [1]	R. D. Higgins, M. D., M. P. H.	DeLand	Do.
District [6]	Irving R. Abrams, M. D.	Green Cove Springs	Do.
Bradford			
Clay			

Local health unit	Name of health officer	Post office address	Official title
Florida—Con.			Director.
District [5]	T. W. Reed, M. D	Pensacola	Do.
Escambia			
Santa Rosa			
District [5]	Jason Miller, M. D. (U. S. Public Health Service).	Apalachicola	Do.
Franklin			
Gulf			
Wakulla			
District [5]	Paul J. Coughlin, M. D	Tallahassee	Do.
Highlands			
Glades			
District [5]	C. A. Adams, Jr., M. D		
Jackson		Marianna	Do.
Washington		Chipley	
District [5]	C. A. O'Quinn, M. D		Do.
Madison		Madison	
Taylor		Perry	
District [5]	Robert M. Robbins, M. D. (U. S. Public Health Service).	DeFuniak Springs	Do.
Walton			
Okaloosa			
Georgia:			
Atlanta [2]	J. F. Hackney, M. D., M. P. H	Atlanta	Do.
Baldwin [1]	Temporary vacancy	Milledgeville	Commissioner of health.
Brooks [1]	do	Quitman	Do.
Bulloch [1]	do	Statesboro	Do.
Calhoun [1]	do	Morgan	Do.
Chatham [3]	C. A. Henderson, M. D	Savannah	Do.
Clarke [3]	W. W. Brown, M. D	Athens	Do.
Cobb [1]	J. E. Lester, M. D	Marietta	Do.
Coffee [1]	Temporary vacancy	Douglas	Do.
Colquitt [1]	T. H. Chesnutt, M. D	Moultrie	Do.
Decatur [1]	M. A. Fort, M. D., D. P. H	Bainbridge	Do.
DeKalb [1]	J. R. Evans, M. D	Decatur	Do.
Dougherty [1]	W. B. Buckner, M. D	Albany	Do.
Floyd [1]	B. V. Elmore, M. D	Rome	Do
Fulton [1]	R. E. McGee, M. D., M. P. H	Atlanta	Do.
Grady [1]	H. P. Rankin, M. D	Cairo	Do.
Greene [1]	W. R. Richards, M. D	Greensboro	Do.
Gwinnett [1]	W. B. Trammell, M. D	Lawrenceville	Do.
Hall	Temporary vacancy	Gainesville	Do.
Hancock [1]	I. H. Moore, M. D	Sparta	Do.
Jefferson [1]	W. D. Martin, M. D	Louisville	Do.
Laurens [1]	O. H. Cheek, M. D	Dublin	Do.
Liberty [1]	M. G. Frich, M. D. (U. S. Public Health Service).	Hinesville	Do.
Lowndes [1]	G. T. Crozier, M. D., D. P. H	Valdosta	Do
Mitchell [1]	Temporary vacancy	Camilla	Do.
Muscogee [3]	J. A. Thrash, M. D., M. P. H	Columbus	Do.
Richmond [3]	C. A. Henderson, M. D	Augusta	Do.
Spalding [3]	T. O. Vinson, M. D	Griffin	Do.
Sumter [1]	H. T. Adkins, M. D	Americus	Do
Terrell [1]	Temporary vacancy	Dawson	Do.
Thomas [1]	H. F. Readling, M. D	Thomasville	Do
Tift [1]	Temporary vacancy	Tifton	Do
Troup [1]	S. C. Rutland, M. D	LaGrange	Do
Walton [1]	Ernest Thompson, M. D	Monroe	Do.
Ware [3]	G. E. Atwood, M. D., D. P. H	Waycross	Do.
Washington [1]	O. L. Rogers, M. D	Sandersville	Do.
Whitfield [3]	C. F. Engelking, M. D	Dalton	Do.
District [5]	Temporary vacancy	Baxley	Do.
Appling			
Wayne			
District [5]	J. D. Applewhite, M. D., M. P. H	Macon	Do.
Bibb			
Jones			
District [5]	Temporary vacancy	Cochran	Do.
Bleckley			
Dodge			
Pulaski			
District [5]	W. D. Lundquist, M. D	Waynesboro	Do.
Burke			
Jenkins			
District [5]	C. W. Harwell, M. D	Cordele	Do.
Crisp			
Worth			
District [5]	M. E. Winchester, M. D., D. P. H.	Brunswick	Do.
Glynn			
McIntosh			
Camden			

Local health unit	Name of health officer	Post office address	Official title
Georgia—Continued.			
District [4]	C. R Arp, M. D	Clarkesville	Commissioner of health.
Habersham			
Rabun			
Stephens			
District [4]	S. L. Harp, M. D	Greenville	Do.
Harris			
Meriwether			
District [4]	Temporary vacancy	McRae	Do.
Telfair			
Wheeler			
District [4]	P. M. Golley, M. D	LaFayette	Do.
Walker			
Catoosa			
Northwestern Region.[4]	R. B. Griffin, M. D	Marietta	Medical director.
Bartow			
Carroll			
Chattooga			
Cherokee			
Dade			
Dawson			
Douglas			
Fannin			
Forsyth			
Gilmer			
Gordon			
Haralson			
Lumpkin			
Murray			
Paulding			
Pickens			
Polk			
Union			
Northeastern Region.	W. B. Harrison, M. D	Gainesville	Do
Banks			
Barrow			
Elbert			
Franklin			
Hart			
Jackson			
Jasper			
Lincoln			
Madison			
Morgan			
Newton			
Oconee			
Oglethorpe			
Putnam			
Rockdale			
Towns			
White			
Wilkes			
West Central Region.[4]	W. D. Cagle, M. D	Griffin	Do.
Butts			
Chattahoochee			
Clayton			
Coweta			
Crawford			
Heard			
Henry			
Houston			
Fayette			
Lamar			
Macon			
Marion			
Monroe			
Peach			
Pike			
Schley			
Talbot			
Taylor			
Upson			
East Central Region.[4]	A. J. Davis, M. D	Swainsboro	Do.
Candler			
Columbia			
Effingham			
Emanuel			
Glascock			
Johnson			

Local health unit	Name of health officer	Post office address	Official title
Georgia—Continued			
East Central Region—Con			
McDuffie			Medical director.
Screven			
Taliaferro			
Treutlen			
Twiggs			
Warren			
Wilkinson			
Southwestern Region [4]	O F Whitman, M D	Albany	Do
Baker			
Ben Hill			
Berrien			
Clay			
Cook			
Dooly			
Early			
Irwin			
Lee			
Miller			
Quitman			
Randolph			
Seminole			
Stewart			
Turner			
Webster			
Wilcox			
Southeastern Region [4]	J D Stillwell M D	Waycross	Do
Atkinson			
Bacon			
Brantley			
Bryan			
Charlton			
Clinch			
Echols			
Evans			
Jeff Davis			
Lanier			
Long			
Montgomery			
Pierce			
Tattnall			
Toombs			
Idaho			
Ada [3]	Blair Points M D (U S Public Health Service)	Boise	Acting director
Bannock [1]	Jesse B Aronson M D	Pocatello	Do
Kootenai [1]	H L Newcombe M D M P H	Coeur d Alene	Director
North Central District [5]	M B Sherrard, M D	Lewiston	Acting director
Clearwater			
Latah			
Nez Perce			
South Central District [5]	G T Parkinson, M D	Twin Falls	Director
Cassia			
Gooding			
Jerome			
Twin Falls			
Illinois			
Adams [3]	H O Collins M D	Quincy	County health officer
Chicago [2]	Herman M Bundesen M D	Chicago	President board of health
Cook [1]	F A Piszczek M D, M P H	do	County health officer
Decatur [2]	I A Steck M D	Decatur	Health commissioner
DuPage [1]	John F Walsh M D	Wheaton	County health officer
Evanston [2]	Winston H Tucker M D Ph D	Evanston	Health commissioner
LaSalle [3]	Arlington Ailes M D, M P H	Peru	County health officer
Lawrence [1]	L W Frame M D M P H	Lawrenceville	Do
Lee [1]	A I Barbakoff M D M S P H	Dixon	Do
Morgan [1]	F I McCord M D	Jacksonville	Do
Peoria [3]	Sumner Miller M D	Peoria	Do
St Clair [3]	R C Farrier M D	East St Louis	Do
Will [1]	Cecil A Z Sharp M D M S P H	Joliet	Do
Williamson [1]	Merle E Cosand M D, M S P H	Herrin	Do
Winnebago [3]	N O Gunderson M D	Rockford	Do
Winnetka [2]	H A Orvis, M D	Winnetka	Health commissioner

Local health unit	Name of health officer	Post office address	Official title
Illinois—Continued.			
District [5]	Donaldson F. Rawlings, M. D., M. P. H.	Cairo	County health officer.
Alexander			
Pulaski			
District [5]	Walter C. Earle, M. D	Champaign	Director.
Champaign, city			
Urbana, city			
District [5]	E. L. Hill, M. D., M. S. P. H	Macomb	Health officer.
Fulton			
McDonough			
District No. 2 [4]	Fred O. Tonney, M. D	Woodstock	District health superintendent.
Boone			
Lake			
McHenry			
District No. 3 [4]	S. S. Reinglass, M. D, M S. P. H.	Dixon	Do.
Carroll			
Jo Daviess			
Ogle			
Stephenson			
District No. 4 [4]	C. E. Kline, M. D., M. S. P. H	Moline	Do.
Bureau			
Henry			
Mercer			
Rock Island			
Whiteside			
District No. 5 [4]	F. A. Tornabene, M. D., M. S. P. H.	Aurora	Do.
DeKalb			
Grundy			
Kane			
Kendall			
District No. 6 [4]	A. J. Levy, M. D., D. P. H	Gilman	Do.
Kankakee			
Champaign			
Ford			
Iroquois			
Livingston			
Vermillion			
District No. 7 [4]	Sandor Horwitz, M. D	East Peoria	Do.
Marshall			
Putnam			
Stark			
Tazewell			
Woodford			
District No. 8 [4]	C. P. McRaven, M. D	Macomb	Do.
Brown			
Hancock			
Henderson			
Knox			
Schuyler			
Warren			
District No. 10 [4]	A. W. Burke, M. D	Springfield	Do.
Cass			
Logan			
Mason			
Menard			
Sangamon			
District No. 11 [4]	R. F. Reider, M. D., D. P. H. (U. S. Public Health Service).	Decatur	Do.
Coles			
DeWitt			
Douglas			
Edgar			
McLean			
Macon			
Moultrie			
Piatt			
District No. 14 [4]	A. C. Baxter, M. D.	Pana	Do
Christian			
Clark			
Cumberland			
Effingham			
Fayette			
Montgomery			
Shelby			
District No. 15 [4]	W. J. Broad, M. D, M. S. P. H	Carlinville	Do.
Calhoun			
Green			
Jersey			
Macoupin			
Pike			
Scott			

Local health unit	Name of health officer	Post office address	Official title
Illinois—Continued			
District No 16 [4]	Norman J Rose, M D, M S P H	Highland	District health superintendent
Bond			
Clinton			
Madison			
District No 17 [4]	J L Bryan, M D	Flora	Do
Clay			
Crawford			
Edwards			
Jasper			
Jefferson			
Marion			
Richland			
Wabash			
Wayne			
District No 18 [4]	S N Mallison M D	Harrisburg	Do
Franklin			
Gallatin			
Hamilton			
Hardin			
Massac			
Pope			
Saline			
White			
District No 19 [4]	Roy W Harrell, M D	Carbondale	Do
Jackson			
Johnson			
Monroe			
Perry			
Randolph			
Union			
Washington			
Indiana			
Indianapolis [3]	H G Morgan M D	Indianapolis	City health officer
Lake [1]	William D Weis M D	Crown Point	County health officer
Vanderburgh [3]	C A Hartley Sr M D	Evansville	Director
District No 1 [4]	Lyman D Eaton M D	Princeton	Do
Gibson			
Knox			
Pike			
Posey			
Sullivan			
Warrick			
District No 2 [4]	Temporary vacancy	Huntingburg	Do
Crawford			
Daviess			
Dubois			
Orange			
Perry			
Spencer			
District No 3 [4]	Maurice Kamp M D	New Albany	Acting director
Clark			
Floyd			
Harrison			
Scott			
Washington			
District No 4 [4]	Temporary vacancy	Versailles	Director
Dearborn			
Jefferson			
Jennings			
Ohio			
Ripley			
Switzerland			
District No 5 [4]	Milton S Ross M D (U S Public Health Service)	Columbus	Acting director
Bartholomew			
Brown			
Decatur			
Jackson			
Johnson			
Shelby			
District No 6 [4]	Temporary vacancy	Bloomington	Director
Greene			
Lawrence			
Martin			
Monroe			
Morgan			
Owen			
District No 7 [4]	Shirley Benham, Jr, M D	LaPorte	Do
LaPorte			
Marshall			
Porter			
Starke			

Local health unit	Name of health officer	Post office address	Official title
Indiana—Continued			
District No 8 [4]	Phillip I Hodkin M D	Rockville	Director
Clay			
Fountain			
Parke			
Vermillion			
Vigo			
Warren			
Iowa			
District No 1 [4]	H H Ennis M D, M P H	Decorah	Medical director
Allamakee			
Blackhawk			
Bremer			
Buchanan			
Butler			
Chickasaw			
Clayton			
Fayette			
Floyd			
Howard			
Mitchell			
Winneshiek			
Worth			
District No 3 [4]	Temporary vacancy	Spencer	Do
Buena Vista			
Cherokee			
Clay			
Dickinson			
Emmett			
Kossuth			
Lyon			
O Brien			
Osceola			
Palo Alto			
Pocahontas			
Sioux			
District No 4 [4]	D M Harris M D, M P H	Sioux City	Do
Crawford			
Ida			
Monona			
Plymouth			
Woodbury			
District No 5 [4]	F J Austin, M D, M P H	Fort Dodge	Do
Calhoun			
Carroll			
Cerro Gordo			
Franklin			
Greene			
Hamilton			
Hancock			
Humboldt			
Sac			
Webster			
Winnebago			
Wright			
District No 6 [4]	F G Zimmerer M D M P H	Des Moines	Do
Adair			
Boone			
Dallas			
Grundy			
Guthrie			
Hardin			
Jasper			
Madison			
Marshall			
Polk			
Story			
Warren			
District No 7 [4]	Ruth F Church, M D, M P H	Washington	Do
Benton			
Johnson			
Iowa			
Keokuk			
Poweshiek			
Tama			
Washington			
District No 8 [4]	Temporary vacancy	Manchester	Do
Cedar			
Clinton			
Delaware			
Dubuque			
Jackson			
Jones			
Linn			
Scott			

Local health unit	Name of health officer	Post office address	Official title
Iowa—Continued			
District No. 9[4]	F. G. Glassock, M. D. (U. S. Public Health Service)	Burlington	Medical director.
Des Moines			
Henry			
Jefferson			
Lee			
Louisa			
Muscatine			
Van Buren			
District No. 10[4]	Temporary vacancy	Centerville	Do.
Appanoose			
Clarke			
Davis			
Decatur			
Lucas			
Mahaska			
Marion			
Monroe			
Ringgold			
Union			
Wapello			
Wayne			
District No. 11[4]	L. J. Belding, M. D., M. P. H.	Council Bluffs	Do.
Adams			
Audubon			
Cass			
Fremont			
Harrison			
Mills			
Montgomery			
Page			
Pottawattamie			
Shelby			
Taylor			
Kansas			
Butler[1]	F. J. Beckner, M. D.	El Dorado	County health officer.
Cherokee[1]	Marion Friedman, M. D.	Columbus	Do.
Cowley[1]	F. A. Kelley, M. D.	Winfield	Do.
Douglas[1]	H. T. Chambers, M. D.	Lawrence	Do.
Geary[1]	Norman A. Burkett, M. D.	Junction City	Do.
Johnson[1]	R. G. Wetterstroem, M. D. (U. S. Public Health Service)	Olathe	Do.
Labette[1]	Oscar Harvey, M. D. (U. S. Public Health Service)	Parsons	Do.
Lyon[1]	C. H. Munger, M. D.	Emporia	Do.
Marion[1]	O. C. McCandless, M. D.	Marion	Do.
Montgomery[1]	D. C. Barrett, M. D. (U. S. Public Health Service)	Independence	Do.
Pratt[1]	F. M. Ireland, M. D.	Pratt	Do.
Riley[1]	F. P. Bestgen, M. D.	Manhattan	Do.
Sedgwick[1]	John W. Turner, M. D.	Wichita	Do.
Shawnee[3]	D. D. Carr, M. D.	Topeka	City-county health officer.
Wyandotte[3]	William H. Pickett, M. D. (U. S. Public Health Service)	Kansas City	Director.
Kentucky			
Bell[3]	T. H. Wells, M. D.	Pineville	County health officer.
Bourbon[1]	G. M. Jewell, M. D. (U. S. Public Health Service)	Paris	Do.
Breathitt[1]	Temporary vacancy	Jackson	Do.
Campbell[3]	R. I. Wehr, M. D., M. P. H.	Newport	Executive health officer.
Christian[3]	R. H. English, M. D. (U. S. Public Health Service)	Hopkinsville	County health officer.
Daviess[3]	F. T. Condon, M. D. (U. S. Public Health Service)	Owensboro	Do.
Estill[1]	R. R. Snowden, M. D.	Irvine	Do.
Fayette[3]	C. D. Cawood, M. D., C. P. H.	Lexington	Do.
Fleming[1]	Roy Orsburn, M. D.	Flemingsburg	Do.
Floyd[1]	Marvin Ransdell, M. D., M. S. P. H.	Prestonsburg	Do.
Graves[1]	N. M. Atkins, M. D.	Mayfield	Do.
Hardin[1]	C. H. Blandford, M. D.	Elizabethtown	Do.
Harlan[1]	J. E. Hynson, M. D.	Harlan	Do.
Henderson[3]	F. W. Sigler, M. D., C. P. H.	Henderson	Do.
Hopkins[1]	C. R. Morton, M. D.	Madisonville	Do.
Jefferson[3]	Hugh R. Leavell, M. D., D. P. H.	Louisville	Director of health.
Kenton[1]	H. C. White, M. D.	Covington	County health officer.
Knott[1]	J. W. Duke, M. D.	Hindman	Do.
Letcher[1]	R. D. Collins, M. D., M. P. H.	Whitesburg	Do.
McCracken[3]	C. E. Reddick, M. D.	Paducah	Do.
Madison[1]	Temporary vacancy	Richmond	Do.
Martin[1]	William N. Keith, M. D.	Inez	Do.
Mason[1]	C. W. Christine, M. D.	Maysville	Do.
Menifee[1]	E. T. Riley, M. D.	Frenchburg	Do.

Local health unit	Name of health officer	Post office address	Official title
Kentucky—Con.			County health officer.
Metcalfe [1]	H. T. Carter, M. D.	Edmonton	Do.
Montgomery [1]	W. G. Morgan, M. D.	Mount Sterling	Do.
Muhlenberg [1]	Agnes L. Brown, M. D. (U. S. Public Health Service).	Greenville	Do.
Oldham [1]	B. C. Wiseman, M. D.	LaGrange	Do.
Owsley [1]	M. B. Gabbard, M. D.	Booneville	Do.
Perry [1]	L. C. Coleman, M. D., C. P. H.	Hazard	Do.
Pike [1]	W. D. Damron, M. D.	Pikeville	Do.
Powell [1]	S. T. Scrivner, M. D.	Stanton	Do.
Rockcastle [1]	Walker Owens, M. D.	Mount Vernon	Do.
Rowan [1]	T. A. E. Evans, M. D.	Morehead	Do.
District [5]	Temporary vacancy		Do.
Adair		Columbia	
Green		Greensburg	
District [5]	P. Q. Peterson, M. D.		Do.
Allen		Scottsville	
Simpson		Franklin	
Warren		Bowling Green	
District [5]	M. H. Skaggs, M. D., C. P. H.		Do.
Anderson		Lawrenceburg	
Shelby		Shelbyville	
District [5]	J. F. Harrell, M. D.		Do.
Ballard		Wickliffe	
Carlisle		Bardwell	
District [5]	Temporary vacancy		Do.
Barren		Glasgow	
Monroe		Tompkinsville	
District [5]	Price Sewell, M. D.		Do.
Boyd		Ashland	
Greenup		Greenup	
District [5]	J. A. Campbell, M. D.		Do.
Bracken		Brooksville	
Scott		Georgetown	
District [5]	Temporary vacancy		Do.
Breckenridge		Hardinsburg	
Hancock		Hawesville	
Meade		Brandenburg	
District [5]	P. F. Orr, M. D., M. P. H.		Do.
Bullitt		Shepherdsville	
Nelson		Bardstown	
Spencer		Taylorsville	
District [5]	E. H. John, M. D.		Do.
Butler		Morgantown	
Edmonson		Brownsville	
District [5]	J. A. Outland, M. D.		Do.
Calloway		Murray	
Trigg		Cadiz	
District [5]	Temporary vacancy		Do.
Caldwell		Princeton	
Crittenden		Marion	
Lyon		Eddyville	
District [5]	D. B. Thurber, M. D.		Do.
Carroll		Carrollton	
Gallatin		Warsaw	
Trimble		Bedford	
District [5]	Don E. Wilder, M. D.		Do.
Carter		Grayson	
Lawrence		Louisa	
District [5]	P. D. Moore, M. D.		Do.
Casey		Liberty	
Lincoln		Stanford	
District [5]	L. H. Wager, M. D., C. P. H.		Do.
Clay		Manchester	
Jackson		McKee	
Leslie		Hyden	
District [5]	W. R. Kelsay, M. D.		Do.
Clinton		Albany	
Cumberland		Burkesville	
Wayne		Monticello	
District [5]	J. M. Dishman, M. D., M. S. P. H.		Do.
Fulton		Hickman	
Hickman		Clinton	
District [5]	Wallace Byrd, M. D., M. S. P. H.		Do.
Grant		Williamstown	
Owen		Owenton	
District [5]	A. B. Colley, M. D.		Do.
Grayson		Leitchfield	
Hart		Munfordville	
District [5]	R. L. Loftin, M. D.		Do.
Harrison		Cynthiana	
Nicholas		Carlisle	
District [5]	E. W. Kissel, M. D.		Do.
Johnson		Paintsville	
Magoffin		Salyersville	

Local health unit	Name of health officer	Post office address	Official title
Kentucky—Con.			
District [5]	R. B. Fulks, M. D		County health officer.
Knox		Barbourville	
Laurel		London	
Whitley		Williamsburg	
District [5]	S. L. Henson, M. D		Do.
Livingston		Smithland	
Marshall		Benton	
District [5]	E. M. Thompson, M. D		Do.
Logan		Russellville	
Todd		Elkton	
District [5]	Joseph Lachman, M. D. (U. S. Public Health Service).		Do.
McCreary		Whitley City	
Pulaski		Somerset	
District [5]	A. D Park, M. D		Do.
McLean		Calhoun	
Ohio		Hartford	
District [5]	J. L. Tanner, M. D., M. P. H		Do.
Mercer		Harrodsburg	
Washington		Springfield	
District [5]	J. L. Cox, M. D		Do.
Morgan		West Liberty	
Wolfe		Campton	
District [5]	E. B. Underwood, M. D		Do.
Union		Morganfield	
Webster		Dixon	
Louisiana:			
Acadia [3]	Benjamin Sachs, M. D	Crowley	Director.
Avoyelles [1]	Temporary vacancy	Marksville	Do
Caddo [3]	W. J. Sandidge, M. D , C P. H	Shreveport	Do
Calcasieu [3]	Temporary vacancy	Lake Charles	Do
Caldwell [1]	S. H. Brown, M. D	Columbia	Do
Cameron [1]	Temporary vacancy	Cameron	Do
East Baton Rouge [3]	do	Baton Rouge	Do
Jefferson [1]	do	Gretna	Do
Ouachita [3]	C. L. Mengis, M. D	Monroe	Do
Pointe Coupee [1]	F. F. Rougon, M D	New Roads	Do
Richland [1]	Harrison Jordon, M D	Rayville	Do.
St. Martin [1]	Temporary vacancy	St Martinville	Do
District [5]	L. T. Donaldson, M. D		Do.
Allen		Oberlin	
Jefferson Davis		Jennings	
District [5]	J. Cyril Eby, M. D		Do.
Ascension		Donaldsonville	
Iberville		Plaquemine	
District [5]	M. F. Houston, M. D		Do.
Assumption		Napoleonville	
La Fourche		Thibodaux	
Terrebonne		Houma	
District [5]	William M. Johnson, M. D		Do.
Beauregard		DeRidder	
Vernon		Leesville	
District [5]	B. L. Stinson, M. D		Do.
Bienville		Arcadia	
Claiborne		Homer	
District [5]	H. N. Barnett, M. D		Do.
Bossier		Benton	
Webster		Minden	
District [5]	E. L Miller, M. D	Jena	Do.
Catahoula			
LaSalle			
District [5]	A. J Reynolds, M. D		Do.
Concordia		Vidalia	
Franklin		Winnsboro	
District [5]	R. A. Tharp, M. D		Do.
DeSoto		Mansfield	
Sabine		Many	
District [5]	W. K. Evans, M. D		Do.
East Carroll		Lake Providence	
West Carroll		Oak Grove	
District [5]	F. V. Boyd, M. D		Do.
Evangeline		Ville Platte	
St. Landry		Opelousas	
District [5]	Edmond Klamde, M. D., M. P. H.		Do.
Grant		Colfax	
Rapides		Alexandria	
District [5]	J. S. May, M. D		Do.
Iberia		New Iberia	
St. Mary		Franklin	
District [5]	E. J. Young, M. D		Do.
Jackson		Winnfield	
Winn		do	
Lincoln		Ruston	

Local health unit	Name of health officer	Post office address	Official title
Louisiana—Con.			
District [5]	A. J. Comeaux, M. D.		Director.
Lafayette		Lafayette	
Vermilion		Abbeville	
District [5]	Temporary vacancy	Tallulah	
Madison			
Tensas			
District [5]	N. P. Liles, M. D.	Bastrop	Do.
Morehouse			
Union			
District [5]	W. W. Knipmeyer, M. D., C. P. H.		Do.
Natchitoches		Natchitoches	
Red River		Coushatta	
District [5]	T. B. Wilson, M. D.		Do.
St Charles		Hahnville	
St. James		Lutcher	
District [5]	H. E. Cannon, M. D.		Do.
St. Tammany		Covington	
Washington		Franklinton	
Maine:			
Auburn [2]	Shirley J Davis, R. N.	Auburn	Local health officer.
Bangor [2]	Harry D. McNeil, M. D	Bangor	Do.
Lewiston [2]	Robert J. Wiseman, Jr., M. D.	Lewiston	Do.
Portland [2]	Travis Burroughs, M. D.	Portland	Do.
Rumford [2]	Thomas S. Burr, M. D	Rumford	Do.
District No. 1 [4]	Temporary vacancy	South Portland	District health officer.
Cumberland			
York			
District No 2 [4]	B. L. Arms, M. D.	Farmington	Do.
Androscoggin			
Franklin			
Oxford			
District No. 3 [4]	J. W. Loughlin, M. D.	Newcastle	Do.
Kennebec			
Knox			
Lincoln			
Sagadahoc			
Waldo			
District No 4 [4]	C. N. Stanhope, M. D.	Dover-Foxcroft	Do.
Penobscot			
Piscataquis			
Somerset			
District No. 5 [4]	Temporary vacancy	Machias	Do.
Hancock			
Washington			
District No. 6 [4]	B. F. Porter, M. D.	Caribou	Do.
Aroostook			
Maryland			
Allegany [3]	W. R. Frantz, M. D.	Cumberland	Acting health officer.
Anne Arundel [1]	W. J. French, M. D.	Annapolis	Health officer.
Baltimore [1]	W. H. F. Warthen, M. D., M. P. H.	Towson	Do.
Baltimore [2]	Huntington Williams, M. D., M. P. H.	Baltimore	Commissioner.
Calvert [1]	I N. King, M. D	Prince Frederick	Health officer.
Caroline [1]	W. B. Johnson, M. D	Denton	Do.
Carroll [1]	W. C. Stone, M. D	Westminster	Do.
Cecil [1]	John Collinson, M. D., D. P. H.	Elkton	Do.
Charles [1]	Daniel S. Fisher, M. D.	La Plata	Do.
Dorchester [1]	E. A. Jones, M D	Cambridge	Do.
Frederick [1]	E. C. Kefauver, M. D.	Frederick	Do.
Garrett [1]	T. R. Shrop, M. D	Oakland	Do.
Harford [1]	T. A Callahan, M. D.	Bel Air	Do.
Howard [1]	Guy B Anderson, M. D	Ellicott City	Do.
Kent [1]	A. F. Whitsitt, M. D., M. P. H.	Chestertown	Do.
Montgomery [1]	V. L. Ellicott, M. D., D. P. H.	Rockville	Do.
Prince Georges [1]	J. M. Byers, M. D.	Upper Marlboro	Do.
Queen Annes [1]	J. A. McCallum, M. D., M. P. H.	Centerville	Do.
St. Marys [1]	E. C. Peck, M. D., M. P. H.	Leonardtown	Do.
Somerset [1]	R. H. Johnson, M. D	Princess Anne	Do.
Talbot [1]	L. S. Welty, M D., M. P. H	Easton	Do.
Washington [2]	W. R. Willard, M. D., D. P. H.	Hagerstown	Do.
Wicomico [1]	S. H. Hurdle, M. D., M. P. H.	Salisbury	Do.
Worcester [1]	L. G. Llewelyn, M. D.	Pocomoke City	Do.
Massachusetts:			
Amesbury [2]	Ralph T. Frisbee	Amesbury	Agent, board of health.
Andover [2]	Lotta Johnson, R. N.	Andover	Do.
Arlington [2]	J. Philip Bower, B. S.	Arlington	Do.
Barnstable [1]	A. P. Goff, M. D.	Hyannis	County health officer.
Belmont [2]	Keble B. Perine, B. S., M. S.	Belmont	Agent, board of health.
Beverly [2]	Thomas H. Scanlon	Beverly	Do.
Boston [2]	G. Lynde Gately, M. D.	Boston	Health commissioner.
Braintree [2]	F. C. Johnson	Braintree	Agent, board of health.
Brockton [2]	Felix S. Duksta	Brockton	Executive officer.

Local health unit	Name of health officer	Post office address	Official title
Massachusetts—Con			
Brookline [2]	Francis P Denny, M D	Brookline	Health officer
Chelsea [2]	John F Welch, A B	Chelsea	Agent board of health
Chicopee [2]	Paul G Martel	Chicopee	Do
Clinton [2]	Frederick F Murphy	Clinton	Do
Danvers [2]	Hugo Nappe	Danvers	Do
Everett [2]	William F Hogan	Everett	Do
Fall River [2]	Arthur J Ledoux M D	Fall River	Health commissioner
Fitchburg [2]	Temporary vacancy	Fitchburg	Health officer
Framingham [2]	David Moxon B S C P H	Framingham	Agent board of health
Franklin [2]	Harlan R McKenzie	Franklin	Do
Gardner [2]	W P O Donnell	Gardner	Do
Gloucester [2]	Patrick F Curley	Gloucester	Do
Greenfield	George P Moore	Greenfield	Do
Haverhill [2]	Frederick W Morse	Haverhill	Do
Hingham [4]	Miriam Manning	Hingham	Do
Holyoke [2]	Daniel P Hartnett Ph G	Holyoke	Health officer
Ipswich [2]	Paul M Jodoin	Ipswich	Agent board of health
Lawrence	Daniel J Costello	Lawrence	Do
Leominster [2]	Hugh T Crain	Leominster	Do
Lowell [2]	John J McNamara M D	Lowell	Director of health
Lynn [2]	James A Dunn M D	Lynn	Health commissioner
Malden [2]	Max C Welsh	Malden	Agent board of health
Marblehead [4]	Everett R Thompson	Marblehead	Do
New Bedford [2]	Archibald N Sinesac M D	New Bedford	Health officer
Newburyport [2]	Wilbur N O Brien Ph G	Newburyport	Agent board of health
Newton	Ernest M Morris M D M P H	Newton	Director of health
North Adams [2]	Earl M Vrooman M D	North Adams	Agent board of health
North Andover [2]	I P Kathan R N	North Andover	Do
Peabody	Temporary vacancy	Peabody	Do
Pittsfield [2]	John W Trask M D	Pittsfield	Commissioner of health
Quincy [2]	Howard F Potter	Quincy	Agent board of health
Revere [2]	Patrick C Brun	Revere	Do
Salem [2]	John J McGrath	Salem	Do
Saugus [2]	John V Spencer	Saugus	Do
Springfield [2]	T J Smith M D	Springfield	Commissioner of health
Stoneham [2]	Gordon F May	Stoneham	Agent board of health
Swampscott [2]	Clarence W Horton	Swampscott	Health officer
Waltham [2]	Joseph J Mulcahy LL B	Waltham	Agent board of health
Watertown [2]	John A Colbert	Watertown	Do
West Springfield [2]	Charles H Mace Jr	West Springfield	Do
Winchester [2]	William B McDonald	Winchester	Do
Winthrop [2]	William D Childress	Winthrop	Do
Woburn	Edward L Gorman	Woburn	Do
Worcester [2]	James O Walls M D M P H	Worcester	Commissioner of health
District No 1 [4]	Harold W Stevens M D	New Bedford	State district health officer
Bristol (excluding 3 townships)			
Dukes			
Nantucket			
Plymouth (12 townships)			
District No 2 [4]	Harry G Wyer M D	Quincy	Do
Bristol (3 townships)			
Middlesex (6 townships)			
Norfolk (excluding 3 townships)			
Plymouth (15 townships)			
District No 3 [4]	A Daniel Rubenstein M D M P H	Boston	Do
Middlesex (17 townships)			
Norfolk (3 townships)			
Suffolk			
District No 4 [4]	Robert E Archibald M D, M P H	Wakefield	Do
Essex			
Middlesex (11 townships)			
District No 5 [4]	Oscar A Dudley M D	Worcester	Do
Hampden (5 townships)			
Hampshire (1 township)			
Worcester (59 townships)			

Local health unit	Name of health officer	Post office address	Official title
Massachusetts—Con.			
District No. 6 [4]	Arthur E. Burke, M. D., C. P. H.	Ayer	State district health officer.
Middlesex (20 townships)			
Worcester (21 townships)			
District No. 7 [4]	Walter W. Lee, M. D., M. P. H.	Greenfield	Do.
Franklin			
Hampden (14 townships)			
Hampshire (15 townships)			
District No. 8 [4]	Temporary vacancy	Pittsfield	Do.
Berkshire			
Hampden (4 townships)			
Hampshire (4 townships)			
Michigan:			
Ann Arbor [2]	J. A. Wessinger, M. D., D. P. H.	Ann Arbor	Director.
Battle Creek [2]	A. A. Hoyt, M. D.	Battle Creek	Do.
Bay [3]	Neal N. Wood, M. D.	Bay City	Do.
Branch [1]	I. O. Church, M. D., M. P. H.	Coldwater	Do.
Calhoun [1]	Hugh Robins, M. D.	Marshall	Do.
Cass [1]	D. H. Swengel, M. D.	Cassopolis	Do.
Chippewa [1]	David Littlejohn, M. D., D. P. H.	Sault Ste. Marie	Do.
Dearborn [2]	Martin F. Buell, M. D.	Dearborn	Do.
Delta [1]	M. S. Elstein, M. D.	Escanaba	Do.
Detroit [2]	Bruce H. Douglas, M. D.	Detroit	Commissioner.
Flint [2]	Temporary vacancy	Flint	Director.
Genesee [1]	L. V. Burkett, M. D., M. P. H.	do	Do.
Grand Rapids [2]	C. C. Slemons, M. D., D. P. H.	Grand Rapids	Do.
Hillsdale [1]	George F. Moench, M. D.	Hillsdale	Do.
Ingham [1]	C. D. Barrett, M. D., C. P. H.	Mason	Do.
Isabella [1]	James P. Sharon, M. D., C. P. H.	Mount Pleasant	Do.
Jackson [2]	E. J. MacLachlan, D. V. M.	Jackson	Do.
Kalamazoo [3]	Gordon B. Moffat, M. D., D. P. H.	Kalamazoo	Do.
Kent [1]	J. D. Brook, M. D.	Grand Rapids	Do.
Lansing [2]	F. R. Town, M. D.	Lansing	Do.
Marquette [2]	C. P. Drury, M. D.	Marquette	Do.
Mason [1]	C. C. Benjamin, M. D., M. S. P. H.	Ludington	Do.
Midland [1]	Ralph R. Sachs, M. D., M. S. P. H.	Midland	Do.
Muskegon [2]	Richard Sears, M. D., M. S. P. H.	Muskegon	Do.
Monroe [1]	Albert E. Heustis, M. D., M. P. H.	Monroe	Do.
Oakland [1]	J. D. Monroe, M. D.	Pontiac	Do.
Ottawa [1]	Ralph Ten Have, M. D., M. P. H.	Grand Haven	Do.
Pontiac [2]	C. A. Neafie, M. D., M. S. P. H.	Pontiac	Do.
Saginaw [2]	F. A. Poole, M. D.	Saginaw	Do.
Saginaw [1]	V. K. Volk, M. D., D. P. H.	do	Do.
Sanilac [1]	Temporary vacancy	Sandusky	Do.
Shiawassee [1]	Helen Lanting, M. D., M. S. P. H.	Corunna	Do.
St. Clair [1]	Albert C. Edwards, M. D., M. P. H.	Port Huron	Do.
St. Joseph [1]	F. A. Musacchio, M. D., M. S. P. H.	Centreville	Do.
Washtenaw [1]	Otto K. Engelke, M. D., M. S. P. H.	Ann Arbor	Do.
Wayne [1]	Temporary vacancy	Dearborn	Do.
Wexford [1]	S. C. Moore, M. D.	Cadillac	Do.
District [5]	Henry H. Asher, M. D.	Manistique	Do.
Alger			
Schoolcraft			
District [5]	M. R. French, M. D.		Do.
Allegan		Allegan	
Van Buren		Paw Paw	
District [5]	A. D. Aldrich, M. D.	Hancock	Do.
Baraga			
Houghton			
Keweenaw			
District [5]	George C. Stucky, M. D.		Do.
Barry		Hastings	
Eaton		Charlotte	
District [5]	L. W. Switzer, M. D., M. S. P. H.	Manistee	Do.
Benzie			
Manistee			
District [5]	Alexander M. Witkow, M. D., M. P. H.		Do.
Dickinson		Iron Mountain	
Menominee		Menominee	
District [5]	B. H. Van Leuven, M. D.	Traverse City	Do.
Grand Traverse			
Leelanau			
District [5]	L. C. Bate, M. D.	Stambaugh	Do.
Iron			
Ontonagon			

Local health unit	Name of health officer	Post office address	Official title
Michigan—Con.			
District [5]	Clifton Hall, M. D., M. P. H.	Big Rapids	Director.
Mecosta			
Osceola			
District No. 1 [5]	C. F. Atkinson, M. D.	Lake City	Do.
Crawford			
Kalkaska			
Missaukee			
Roscommon			
District No 2 [5]	Robert C. Strode, M. D.	West Branch	Do.
Alcona			
Iosco			
Ogemaw			
Oscoda			
District No. 3 [5]	A. F. Litzenburger, M. D.	Charlevoix	Do.
Antrim			
Charlevoix			
Emmet			
Otsego			
District No. 4 [5]	James F. Wilson, M. D.	Rogers City	Do.
Alpena			
Cheboygan			
Montmorency			
Presque Isle			
District No. 5 [5]	Temporary vacancy	White Cloud	Do.
Lake			
Newaygo			
Oceana			
District No. 6 [5]	Sidney I. Franklin, M.D., M.S. P. H.	Newberry	Do.
Luce			
Mackinac			
District No. 7 [5]	Madelene M. Donnelly, M. D.	Gladwin	Do.
Arenac			
Clare			
Gladwin			
Minnesota:			
Duluth [2]	M. McC. Fischer, M. D.	Duluth	Do.
Minneapolis [2]	F. E. Harrington, M. D.	Minneapolis	Commissioner.
Rochester [2]	F. M. Feldman, M. D., D P. H.	Rochester	City health officer.
District No. 1 [4]	P. T. Watson, M. D., M. P. H.	Bemidji	Director.
Beltrami			
Clearwater			
Hubbard			
Itasca			
Koochiching			
District No. 2 [4]	F. W. Engdahl, M. D.	Mankato	Do.
Blue Earth			
Brown			
Faribault			
Freeborn			
Jackson			
Le Sueur			
Martin			
Nicollet			
Sibley			
Steele			
Waseca			
Watonwan			
District No. 3 [4]	F. M. Feldman, M. D., D P. H.	Rochester	Acting director.
Dodge			
Fillmore			
Goodhue			
Houston			
Mower			
Olmsted			
Wabasha			
Winona			
District No. 4 [4]	C. A. Scherer, M. D	Duluth	Director.
Carlton			
Cook			
St. Louis			
Mississippi:			
Adams [3]	A. R. Perry, M. D., M. P. H.	Natchez	Do.
Amite [1]	Corinne S. Eddy, M. D., M. S. P. H.	Liberty	Do.
Bolivar [1]	R. D. Dedwylder, M. D	Cleveland	Do.
Calhoun [1]	R. L. Wyatt, M. D	Calhoun City	Do.
Chickasaw [1]	Temporary vacancy	Houston	Do.
Claiborne [1]	D. J. Williams, M. D	Port Gibson	Acting director.
Clay [1]	C. M. Roberts, M. D	West Point	Director.
Coahoma [3]	Guy R. Post, M. D., C. P. H.	Clarksdale	Do.
Copiah [1]	Thomas Burk, M. D	Hazlehurst	Do.
Forest [3]	B. D. Blackwelder, M. D., C. P. H.	Hattiesburg	Do.
Grenada [1]	F. L. McGahey, M. D	Grenada	Do.
Hancock [1]	C. M. Shipp, M. D	Bay St. Louis	Do.

Local health unit	Name of health officer	Post office address	Official title
Mississippi—Con			
Harrison [1]	H W Kassel M D (U S Public Health Service)	Gulfport	Acting director
Hinds [3]	George F Riley M D C P H	Jackson	Director
Holmes [1]	W H Weeks M D	Lexington	Do
Humphreys [1]	J W Barkley M D	Belzoni	Do
Jackson [1]	Henry B Hoff M D M P H (U S Public Health Service)	Pascagoula	Acting director
Jones [3]	F Paul Haney M D D P H	Laurel	Director
Kemper [1]	R N Crockett M D	DeKalb	Do
Lamar [1]	J N Mason M D	Purvis	Do
Lauderdale [3]	N C Knight M D C P H	Meridian	Do
Leake [1]	Virginia Howard M D M P H	Carthage	Do
Lee [1]	W H Cleveland M D	Tupelo	Do
Leflore [3]	J W Dabbs M D	Greenwood	Do
Lincoln [1]	A R May M D C P H	Brookhaven	Do
Lowndes [3]	J H White M D	Columbus	Do
Madison [1]	J W Dugger M D	Canton	Acting director
Marion [1]	J A Sparks M D	Columbia	Director
Monroe [3]	Charles H Love M D	Aberdeen	Do
Noxubee [1]	J I Bradley M D	Macon	Do
Pearl River [1]	R J Simmons M D	Poplarville	Do
Pike [1]	Sidney J William M D C P H	McComb	Do
Prentiss [1]	Temporary vacancy	Booneville	Do
Rankin [1]	L B Trapp M D	Brandon	Acting director
Simpson [1]	R G Head M D	Mendenhall	Director
Sunflower [1]	Margaret Seann ll M D	Indianola	Do
Tallahatchie [1]	J M Campbell M D	Charleston	Do
Tunica [1]	T K Chandler M D	Tunica	Do
Warren [3]	L Michael Smith M D	Vicksburg	Do
Washington [3]	L P Ward M D M P H	Greenville	Do
Wilkinson [1]	R M Wingard M D	Woodville	Acting director
Yazoo [1]	R W Williams M D (U S Public Health Service)	Yazoo City	Do
District [5]	W D May M D		Director
Alcorn		Corinth	
Tishomingo		Iuka	
District [5]	Barbara Hunt M D	Shubuta	Acting director
Clarke			
Wayne			
District [5]	H H Rutledge M D		
DeSoto		Hernando	Do
Tate		Senatobia	Director
District [5]	W F Bell M D	Bay Springs	Do
Jasper			
Smith			
District [5]	R L Trust M D		
LaFayette		Oxford	Acting director
Panola		Batesville	Director
District [5]	R H Bostwick M D		
Marshall		Holly Springs	Acting director
Union		New Albany	Director
District [5]	B A Stafford M D	Rolling Fork	Do
Sharkey			
Issaquena			
Southeastern District [5]	R A Brannon M D	Lucedale	Do
George			
Greene			
Perry			
Stone			
District [5]	A A Adcn M D	Ripley	Do.
Tippah			
Benton			
Tri county District [5]	J T Holder M D	Prentiss	Do.
Covington			
Jefferson Davis			
Lawrence			
Missouri			
Cass [1]	F M Griffith M D	Harrisonville	Health officer
Greene [1]	T R Amos M D	Springfield	Do
Jackson [1]	William F McCarthy M D	Independence	Do
Jasper [1]	Robert M Ferguson M D	Webb City	Do
Johnson [1]	Harlan H Tyner M D	Warrensburg	Do
Kansas City [3]	Hugh I Dwyer M D M P H	Kansas City	Do
Laclede [1]	Temporary vacancy	Lebanon	Do
Marion [3]	F M Lucke M D	Hannibal	Do
Miller	M J Ayras M D	Tuscumbia	Do
Newton [3]	D A Campbell M D	Neosho	Do
Pemiscot [1]	Fred L Ogilvie M D	Caruthersville	Do
Phelps [4]	R F Knowles M D	Rolla	Do
Platte [1]	E W Cline M D	Platte City	Do
Pulaski [1]	Neal Loughill M D	Waynesville	Do
St Louis [1]	L G McGavran M D M P H	Clayton	Do
St Louis [3]	Joseph F Bredeck M D D P H	St Louis	Do

Local health unit	Name of health officer	Post office address	Official title
Missouri—Con.			
Texas [1]	Charles R. Ozias, M. D.	Houston	Health officer.
Springfield [2]	W. E. Handley, M. D.	Springfield	Do.
District No. 2 [4]	Herbert E. Miller, M. D.	Sikeston	Do.
Butler			
Dunklin			
Mississippi			
New Madrid			
Scott			
Stoddard			
District No. 4 [4]	Temporary vacancy	Fredericktown	Do.
Bollinger			
Cape Girardeau			
Iron			
Madison			
Perry			
St. Genevieve			
St. Francois			
Washington			
Wayne			
District No. 5 [4]	S. B. Beecher, M. D.	Salem	Do.
Carter			
Crawford			
Dent			
Howell			
Oregon			
Reynolds			
Ripley			
Shannon			
District No. 6 [4]	Temporary vacancy	Monett	Do.
Barry			
Barton			
Christian			
Dade			
Douglas			
Lawrence			
McDonald			
Ozark			
Stone			
Taney			
Webster			
Wright			
District No. 7 [4]	Temporary vacancy	Osceola	Do.
Bates			
Benton			
Camden			
Cedar			
Dallas			
Henry			
Hickory			
Morgan			
Polk			
St. Clair			
Vernon			
District No. 8 [4]	L. M. Garner, M. D., M. P. H.	Higginsville	Do.
Carroll			
Chariton			
Clay			
Cooper			
Howard			
Lafayette			
Pettis			
Ray			
Saline			
District No. 9 [4]	Temporary vacancy	Owensville	Do.
Boone			
Callaway			
Cole			
Franklin			
Gasconade			
Jefferson			
Lincoln			
Maries			
Moniteau			
Montgomery			
Osage			
St. Charles			
Warren			
District No. 10 [4]	Temporary vacancy	Kirksville	Do.
Adair			
Audrain			
Clark			
Knox			
Lewis			
Macon			

Local health unit	Name of health officer	Post office address	Official title
Missouri—Continued.			
District No. 10—Continued.			
Monroe			
Pike			
Putnam			
Ralls			
Randolph			
Schuyler			
Scotland			
Shelby			
Sullivan			
District No. 11 [4]	Temporary vacancy	Cameron	Health officer.
Andrew			
Atchison			
Caldwell			
Clinton			
Daviess			
De Kalb			
Gentry			
Grundy			
Harrison			
Holt			
Linn			
Livingston			
Mercer			
Nodaway			
Worth			
Montana:			
Cascade [2]	Thomas F. Walker, M. D	Great Falls	City-county health officer.
Gallatin [2]	A. D. Brewer, M. D	Bozeman	Do.
Lewis and Clark [2]	R. J. Shale, M. D	Helena	Do.
Missoula [2]	F. D. Pease, M. D	Missoula	Do.
Nebraska:			
Thomas [1]	Norton Bare, M. D	Thedford	Health officer.
District [4]	F. P. Bestgen, M. D., M. P. H	Grand Island	Director.
Adams			
Hall			
District [4]	Edmund J. Tierney, M. D	Bellevue	Do.
Cass			
Sarpy			
District [4]	Gregory L. Endres, M. D., M. P. H. (U. S. Public Health Service).	Wahoo	Do.
Dodge			
Saunders			
District [4]	Vernon M. Winkle, M. D	Gering	Do.
Banner			
Box Butte			
Cheyenne			
Morrill			
Scotts Bluff			
Nevada:			
Clark [1]	Thomas E. Morgan, M. D. (U. S. Public Health Service).	Las Vegas	Medical officer in charge.
New Hampshire:			
Berlin [2]	Charles H. Ross	Berlin	Health officer.
Concord [2]	Temporary vacancy	Concord	Do.
Dover [2]	Thomas P. McDonough	Dover	Do.
Keene [2]	Evan C. White	Keene	Do.
Manchester [2]	Howard A. Streeter, M. D	Manchester	Do.
Nashua [2]	Henri E. Labine	Nashua	Do.
Eastern Health District.[4]	Rolla Strobach, M. D. (U. S. Public Health Service).	Exeter	Do.
Rockingham			
Strafford			
New Jersey:			
Belleville [2]	Eugene T. Berry	Belleville	Do.
Bloomfield [2]	Charles T. Foulk	Bloomfield	Do.
Camden [2]	A. L. Stone, M. D	Camden	Director of health.
Carteret [2]	Michael Yarcheski	Carteret	Health officer.
Dover [2]	George E. Laubach	Dover	Do.
East Orange [2]	Frank J. Osborne	East Orange	Do.
Elizabeth [2]	Louis J. Richards	Elizabeth	Do.
Glen Ridge [2]	Otto B. Schalk	Glen Ridge	Do.
Hackensack [2]	L. Van D. Chandler	Hackensack	Do.
Harrison [2]	John T. McClure	Harrison	Do.
Hillside [2]	S. J. Jowitt	Hillside	Do.
Irvington [2]	William S Bailey	Irvington	Do.
Jersey City [2]	Dennis J. Sullivan	Jersey City	Chief health officer.
Kearny [2]	Amos Field, Jr	Kearny	Health officer.
Linden [2]	M. E. Noe	Linden	Do.
Lyndhurst [2]	John McGarry	Lyndhurst	Do.
Maplewood [2]	Marie A. Harrison	Maplewood	Do.
Montclair [2]	Carl T. Pomeroy, C. P. H	Montclair	Do.

Local health unit	Name of health officer	Post office address	Official title
New Jersey—Con.			
Morris [2]	David R. O'Keefe	Morristown	Health officer.
Morristown [2]	John F. Kilkenney	do	Do.
Neptune [2]	W. Stanley Applegate	Neptune	Do.
Newark [2]	Charles V. Craster, M. D., D. P. H.	Newark	Do.
North Arlington [2]	Charles Kientz	North Arlington	Do.
North Bergen [2]	Edward Cumiskey	North Bergen	Do.
Nutley [2]	R. V. Fellers	Nutley	Do.
Ocean City [2]	Harold W. Hager	Ocean City	Do.
Orange [2]	W. M. Brien, M. D	Orange	Do.
Paterson [2]	Frederick P. Lee, M. D	Paterson	Do.
Perth Amboy [2]	C. S. Thompson, D. V. M	Perth Amboy	Do.
Plainfield [2]	Andrew J. Krog	Plainfield	Do.
Princeton [2]	William Blake	Princeton	Do.
Rahway [2]	Fred M. Williams	Rahway	Do.
Rutherford [2]	Marine Dunn	Rutherford	Do.
Trenton [2]	J. A Connelly, M. D.	Trenton	Do.
West New York [2]	Eugene Speranza	West New York	Do.
West Orange [2]	Herman Fredericks, M. D	West Orange	Do.
District [5]	John G. Robbins	Bridgeton	Do.
Bridgeton, city			
Upper Deerfield, township.			
District [5]	Hugh B. Martin	Englewood	Do.
Englewood, city.			
Tenafly, borough.			
District [5]	Cora Glynn	Franklin	Do.
Franklin, borough.			
Ogdensburg, borough.			
District [5]	C M. Bowen	Westwood	Do.
Haworth, borough.			
Washington, township.			
Westwood, borough.			
District [5]	Fred C. Metzger	Pennsauken	Do.
Merchantville, borough.			
Pennsauken, township.			
District [5]	F. E. Whitehead	Oradell	Do.
Oradell, borough			
River Edge, borough.			
District [5]	Percy de Stanley, M. D.	Union	Do.
Roselle Park, borough.			
Union, township			
District [5]	Andrew Carney	Westfield	Do.
Scotch Plains, township.			
Westfield, town			
Monmouth Health Unit No. 1 (5 municipalities).[5]	Budd H. Obert	Asbury Park	Do.
Monmouth Health Unit No. 2 (6 municipalities).[5]	Edwin F. Stewart, M. D	Fair Haven	Do.
Monmouth Health Unit No. 3 (5 municipalities).[5]	Joseph F. Emmons	Long Branch	Do.
Union County Health Unit (5 municipalities).[5]	William J. Willsey	Cranford	Do.
District [4]	Nelson E. Newbury, M. D	Mays Landing	Do.
Atlantic			
Cape May			
Part of Ocean			
District [4]	Ralph T. Fisher, M. Sc	Mount Holly	Do.
Burlington			
District [4]	Clyde R. Newell	Hackensack	Do.
Bergen			
Passaic			
District [4]	Harry F. Leeds	Pitman	Do.
Camden			
Cumberland			
Gloucester			
Salem			
District [4]	Albert B. Rosenberg, M. D	Highland Park	Do.
Hunterdon			
Somerset			
Part of Middlesex			

Local health unit	Name of health officer	Post office address	Official title
New Jersey—Con.			
District [4]	Fred L. Crocker	Freehold	Health officer.
Monmouth			
Part of Ocean			
Part of Middlesex			
District [4]	Harry R. H. Nicholas	Dover	Do.
Morris			
Sussex			
Warren			
New Mexico:			
District No. 1 [4]	Horry Payne, M. D	Santa Fe	District health officer.
Rio Arriba			
Santa Fe			
Taos			
District No. 2 [4]	Edgar B. Beaver, M. D	Gallup	Do.
McKinley			
San Juan			
District No. 3 [4]	D. C. Parmonter, M. D	Albuquerque	Acting district health officer.
Bernalillo			
Sandoval			
District No. 4 [4]	C. W. Gerber, M. D	Las Cruces	District health officer.
Dona Ana			
Lincoln			
Otero			
Sierra			
District No. 5 [4]	J. R. Wright, M. D	Las Vegas	Acting district health officer.
Guadalupe			
Mora			
San Miguel			
District No. 6 [4]	O. E. Puckett, M. D	Carlsbad	District health officer
Chaves			
Eddy			
Lea			
District No. 7 [4]	J. C. Mitchell, M. D., C. P. H	Silver City	Do.
Grant			
Hidalgo			
Luna			
District No. 8 [4]	A. J. Evans, M. D	Los Lunas	Do
Catron			
Socorro			
Torrance			
Valencia			
District No. 9 [4]	Frank C. Diver, M. D	Raton	Do.
Colfax			
Harding			
Union			
District No. 10 [4]	H. D. Newman, M. D	Clovis	Do.
Curry			
DeBaca			
Quay			
Roosevelt			
New York:			
Albany [2]	Daniel V. O'Leary, M. D	Albany	Health officer.
Binghamton [2]	Chalmers J. Longstreet, M. D	Binghamton	Do.
Buffalo [2]	Francis E. Fronczak, M. D	Buffalo	Health commissioner.
Cattaraugus [2]	Wendell R. Ames, M. D., C. P. H	Olean	Do.
Columbia [2]	Sue H. Thompson, M. D., M. P. H	Hudson	Do.
Cortland [2]	William E. Mosher, Jr., M. D., M. P. H.	Cortland	Do.
Dunkirk [2]	Edgar Bieber, M. D	Dunkirk	Health officer and school physician.
Glens Falls [2]	Virgil D. Selleck, M. D	Glens Falls	Health officer.
Ithaca [2]	Robert H. Broad, M. D., M. P. H	Ithaca	Health officer and school physician.
Mount Vernon [2]	Theodore A. Jost, M. D., M. P. H	Mount Vernon	Commissioner of health.
Nassau [2]	Earle G. Brown, M. D	Mineola	Health commissioner.
New Rochelle [2]	Chester A. Hicks, M. D., D. P. H	New Rochelle	Director of public health.
Niagara Falls [2]	Edward E. Gillick, M. D	Niagara Falls	Health officer.
New York [2]	Ernest L. Stebbins, M. D., C. P. H	New York	Commissioner of health.
Poughkeepsie [2]	William H. Conger, M. D	Poughkeepsie	Health officer.
Rochester [2]	Arthur M. Johnson, M. D	Rochester	Do.
Schenectady [2]	William C. Treder, M. D	Schenectady	Commissioner health.
Suffolk [1]	Arthur T. Davis, M. D	Riverhead	Health commissioner.
Syracuse [2]	H. Burton Doust, M. D	Syracuse	Do.
Utica [2]	Hugh H. Shaw, M. D., C. P. H	Utica	Health officer.
Westchester [2]	William A. Holla, M. D	White Plains	Health commissioner.
Yonkers [2]	Eugene F. McGillian, M. D., M. A. P. H.	Yonkers	Commissioner of health.

Local health unit	Name of health officer	Post office address	Official title
New York—Con.			
District [4]	Frank E. Cooghlin, M. D., D. P. H.	Albany	District State health officer.
Albany			
Rensselaer			
Schenectady			
District [4]	John A. Conway, M. D	Hornell	Do.
Allegany			
Chemung			
Steuben			
District [4]	Ralph M. Vincent, M. D., M. P. H.	Binghamton	Do.
Broome			
Chenango			
Tioga			
District [4]	Edward B. Bukowski, M. D., D. P. H.	Syracuse	Acting district State health officer.
Cayuga			
Onondaga			
Oswego			
District [4]	Joseph P. Garen, M. D., C. P. H.	Saranac Lake	District State health officer.
Clinton			
Essex			
Franklin			
Hamilton			
District [4]	Ray C. Champlin, M. D., C. P. H.	Oneonta	Do.
Delaware			
Otsego			
Schoharie			
District [4]	Bertrand E. Roberts, M D	Poughkeepsie	Do.
Dutchess			
Putnam			
District [4]	Archibald S. Dean, M. D., D. P. H	Buffalo	Do.
Erie			
Niagara			
Subdistrict	Walter C. Levy, M. D., C. P. H.	Jamestown	Acting district State health officer.
Chautauqua			
Subdistrict	Gordon R. Gray, M. D., C. P. H	Batavia	District State health officer.
Genesee			
Orleans			
Wyoming			
District [4]	James J. Quinlivan, M. D., C. P. H.	Amsterdam	Do.
Fulton			
Montgomery			
District [4]	Berwyn F. Mattison, M. D., M. P. H.	Kingston	Acting district State health officer.
Greene			
Ulster			
District [4]	Samuel Hyman, M. D., C. P. H.	Utica	Health commissioner.
Herkimer			
Madison			
Oneida			
District [4]	Stanley W. Sayer, M. D	Gouverneur	District State health officer.
Jefferson			
Lewis			
St. Lawrence			
District [4]	Paul A. Lembcke, M. D., C. P. H.	Rochester	Do.
Livingston			
Monroe			
Wayne			
District [4]	Philip J. Rafle, M. D., C. P. H.	New York	Do.
Nassau			
Suffolk			
Westchester			
District [4]	Don M. Griswold, M. D., D. P. H.	Geneva	Do.
Ontario			
Seneca			
Yates			
District [4]	Harry L. Chant, M. D., C. P. H	Middletown	Do.
Orange			
Rockland			
Sullivan			
District [4]	Burke Diefendorf, M. D	Glens Falls	Do.
Saratoga			
Warren			
Washington			
District [4]	Raymond D. Fear, M. D., D. P. H.	Ithaca	Do.
Schuyler			
Tompkins			

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Local health unit	Name of health officer	Post office address	Official title
North Carolina:			
Alamance [1]	Joseph Lindsay Cook, M. D	Graham	County health officer.
Asheville [2]	Margery J. Lord, M. D	Asheville	City health officer.
Beaufort [1]	D. E. Ford, M. D	Washington	County health officer.
Bladen [1]	Robert S Cromartie, M. D	Elizabethtown	Do.
Buncombe [1]	Wilfred N. Sisk, M. D., M. P. H.	Asheville	Do.
Cabarrus [3]	M. B. Bethel, M. D., M. P. H	Concord	Do.
Carteret [1]	Charles B. Stevick, M D.	Beaufort	Do.
Charlotte [2]	Greene Lee Rea, M. D	Charlotte	City health officer.
Cleveland [1]	Z P. Mitchell, M. D	Shelby	County health officer
Columbus [1]	Floyd Johnson, M. D	Whiteville	Do.
Craven [3]	Robert Sherwood McGeachy, M. D.	New Bern	Do.
Cumberland [3]	Malcom Tennyson Foster, M. D., M. P. H.	Fayetteville	Do.
Davidson [3]	Grover Cleveland Gambrell, M. D.	Lexington	Do.
Duplin [1]	C. H Woodburn, M. D	Kenansville	Do.
Durham [3]	J. H. Epperson, M. S	Durham	Superintendent of health.
Franklin [1]	S. P. Burt, M D	Louisburg	Acting county health officer.
Gaston [1]	Robert Edgar Rhyne, M. D	Gastonia	County health officer.
Granville [1]	Ballard Norwood, M. D	Oxford	Do.
Greene [1]	E. H Ellinwood, M. D	Snow Hill	Do
Greensboro [2]	F. K Harder, M. D., M. P. H.	Greensboro	City health officer.
Guilford [1]	Roderick Mark Buie, M. D	do	County health officer.
Harnett [1]	John A. Lineberry, M. D	Lillington	Do.
High Point [2]	Robert Alexander Herring, M. D.	High Point	City health officer.
Iredell [1]	L. B Skeen, M. D	Statesville	County health officer.
Johnston [1]	Edward S. Grady, M. D	Smithfield	Do.
Lenoir [3]	C. L. Williams, Jr., M D. (U. S. Public Health Service).	Kinston	Do.
Martin [1]	John W. Williams, M. D., M. P. H.	Williamston	Do.
Mecklenburg [1]	Edgar Hall Hand, M. D	Charlotte	Do.
Nash [1]	John S. Chamblee, M. D	Nashville	Do.
New Hanover [1]	Avon Hall Elliot, M. D	Wilmington	Do.
Pitt [3]	N. Thomas Ennett, M D	Greenville	Do.
Randolph [1]	George Herbert Sumner, M. D	Asheboro	Do.
Richmond [1]	G. F. Meadors, M. D. (U. S. Public Health Service).	Rockingham	Do.
Robeson [1]	Eugene Ramsey Hardin, M. D	Lumberton	Do.
Rockingham [1]	B. M. Drake, M. D	Spray	Do.
Rocky Mount [2]	James Allen Whitaker, M. D	Rocky Mount	City health officer.
Rowan [3]	Charles W. Armstrong, M. D.	Salisbury	County health officer.
Sampson [1]	Jabez H. Williams, M. D	Clinton	Do.
Scotland [1]	O. David Garvin, M. D., M. P. H. (U. S. Public Health Service).	Laurinburg	Do.
Stanly [1]	Wayland Nash McKenzie, M. D.	Albemarle	Do.
Surry [1]	R. B. C. Franklin, M. D	Mount Airy	Do.
Union [1]	Clem Ham, M. D	Monroe	Do.
Vance [1]	Alfred D. Gregg, M. D	Henderson	Do.
Wake [3]	Alexander C. Bulla, M. D	Raleigh	Do.
Wayne [3]	Samuel B. McPheeters, M. D	Goldsboro	Do.
Wilkes [1]	A. J. Eller, M. D.	Wilkesboro	Do.
Wilson [3]	Wade Hampton Anderson, M. D.	Wilson	Do.
Winston-Salem [2]	Romulus Lee Carlton, M. D	Winston-Salem	City health officer.
District [4]	Robert Rogers King, M. D	Boone	District health officer.
Alleghany			
Ashe			
Watauga			
District [4]	Loren Wallin, M. D	Wadesboro	Do.
Anson			
Montgomery			
District [4]	B. B. McQuire, M. D	Burnsville	Do.
Avery			
Yancey			
District [4]	J. McIver Jackson, M. D	Windsor	Do.
Bertie			
Chowan			
Gates			
District [4]	Len D. Hagaman, M. D	Lenoir	Do.
Burke			
Caldwell			
District [4]	Daniel C. Hackett, M. D. (U. S. Public Health Service).	Elizabeth City	Do.
Camden			
Pasquotank			
Perquimans			
District [5]	H. C. Whims, M. D	Newton	Do.
Catawba			
Lincoln			

Local health unit	Name of health officer	Post office address	Official title
North Carolina—Con.			
District [5]	William P. Richardson, M. D., M. P. H.	Chapel Hill	District health officer.
Chatham			
Orange			
Person			
District [5]	Murray P. Whichard, M. D.	Murphy	Do.
Cherokee			
Clay			
Graham			
District [5]	K. C. Moore, M. D.	Currituck	Do.
Currituck			
Dare			
District [5]	J. Roy Hege, M. D., M. P. H.	Winston-Salem	Do.
Davie			
Forsyth			
Stokes			
Yadkin			
District [5]	William K. McDowell, M. D.	Tarboro	Do.
Edgecombe			
Halifax			
District [5]	Crote Nixon Sisk, M. D	Waynesville	Do.
Haywood			
Jackson			
Macon			
Swain			
Transylvania			
District [5]	W Raleigh Parker, M. D	Jackson	Do.
Hertford			
Northampton			
District [5]	J. W Willcox, M. D	Carthage	Do.
Hoke			
Moore			
District [5]	J. J. Croley, M. D	Plymouth	Do.
Hyde			
Tyrell			
Washington			
District [5]	Hamilton Wright Stevens, M. D.	Jacksonville	Do.
Onslow			
Pender			
District [5]	B. E. Washburn, M. D	Rutherfordton	Do.
Polk			
Rutherford			
North Dakota:			
Fargo [2]	E M. Watson, M D	Fargo	City health officer.
Ward [3]	Temporary vacancy	Minot	Health director.
District [4]	E. L. Soderlin, M. D.	Valley City	District health officer.
Barnes			
Dickey			
LaMoure			
Ransom			
Sargent			
Stutsman			
Ohio:			
Akron [2]	M. D. Ailes, M. D	Akron	Health commissioner.
Ashtabula [1]	Charles C. Crosby, M D	Jefferson	Do.
Athens [3]	Benedict B Backley, M. D	Athens	Do.
Belmont [1]	Homer S. West, M. D	St. Clairsville	Do.
Butler [3]	H. A. Moore, M. D	Hamilton	Do.
Canton [2]	F. M. Sayre, M. D	Canton	Do.
Cincinnati [2]	Carl A. Wilzbach, M. D	Cincinnati	Do.
Clermont [1]	Arthur B. Ream, M. D	Batavia	Do.
Cleveland [2]	Harold J. Knapp, M. D	Cleveland	Do.
Cleveland Heights [2]	Robert Lockhart, M. D	Cleveland Heights	Do.
Clinton [3]	R. W. DeCrow, M. D	Wilmington	Do.
Columbus [2]	N. C. Dysart, M. D	Columbus	Do.
Crawford [1]	G. T. Wasson, M. D	Bucyrus	Do.
Cuyahoga [3]	A. J. Pearse, M. D	Cleveland	Do.
Darke [3]	W. D. Bishop, M. D	Greenville	Do.
Dayton [2]	H H. Williams, M. D	Dayton	Do.
Delaware [3]	Elizabeth Workman, M. D	Delaware	Do.
Erie [3]	F. E. Mahla, M. D	Sandusky	Do.
Fairfield [1]	W. R. Coleman, M. D	Lancaster	Do.
Fayette [1]	W. D. Maag, M. D	Washington Court-house.	Do.
Findlay [2]	Martha Laffey, R. N	Findlay	Do.
Greene [3]	G. E. Savage, M. D	Xenia	Do.
Hamilton [3]	E. H. Schoenling, M. D	Cincinnati	Do.
Hamilton [2]	A. M. Clark	Hamilton	Do.
Hancock [1]	S. F. Whistler, M. D	Findlay	Do.
Huron [3]	W. W. Lawrence, M. D	Norwalk	Do.
Ironton [2]	H. S. Allen, M. D	Ironton	Do.
Jefferson [1]	S. J. Heeley, M. D	Steubenville	Do.
Logan [3]	Lee Trapl, M. D	Bellefontaine	Do.

Local health unit	Name of health officer	Post office address	Official title
Ohio—Con			
Lorain [1]	Lorin F Kerr M D	Oberlin	Health commissioner.
Lucas [1]	T W Mahoney M D	Toledo	Do
Mahoning [1]	S G Patton M D	Youngstown	Do
Marion [1]	N Sifritt M D	Marion	Do
Medina [3]	H P H Robinson, M D	Medina	Do
Meigs [1]	W S Ellis M D	Pomeroy	Do
Miami [3]	Harry Wain M D	Troy	Do
Montgomery [3]	H H Pansing M D	Dayton	Do
Morrow [1]	F M Hartsook M D	Mount Gilead	Do
Muskingum [1]	Beatrice T Hagen M D	Zanesville	Do
Painesville [2]	Clara C Wilder R N	Painesville	Do
Portage [1]	P I Harris M D	Ravenna	Do
Preble [1]	Carle W Beane M D	Eaton	Do
Richland [3]	William B Wild M D	Mansfield	Do
Ross [3]	R F Bower M D	Chillicothe	Do
Sandusky [1]	F M Teeple M D	Fremont	Do
Shelby [3]	G J Nordenbrock M D	Sidney	Do
Springfield [2]	R R Richison M D	Springfield	Do
Stark [1]	Floyd R Stamp M D	Canton	Do
Steubenville [2]	Julius Pizzoferrato	Steubenville	Do
Summit [3]	F R Shaffer M D	Akron	Do
Toledo [2]	Earl F Kleinschmidt	Toledo	Do
Trumbull [1]	L A Connell M D	Warren	Do
Washington [1]	H T Dickson M D	Marietta	Do
Wayne [3]	J J Sutter, M D	Wooster	Do
Wood [3]	H J Powell M D	Bowling Green	Do
Wyandot [1]	L W Naus M D	Upper Sandusky	Do
District [5] Adams Brown	R L Lawwill M D	West Union	Do
District [5] Hocking Vinton	H G Southard M D	Logan	Do
District [5] Madison Union	F M Wurtsbaugh, M D	London	Do
Oklahoma			
Atoka [1]	H C Huntley M D	Atoka	Director
Blaine [1]	H R Anderson M D	Watonga	Do
Bryan [3]	Paul Sizemore M D	Durant	Do
Caddo [1]	Preston F Wright M D	Anadarko	Do
Carter [3]	J C Canada M D	Ardmore	Do
Cleveland [3]	Gertrude Nielsen M D	Norman	Do
Comanche [3]	W T Parker M D	Lawton	Do
Creek [1]	Philip G Joseph M D	Sapulpa	Do
Kay [3]	J H Kinnaman M D, M P H	Ponca City	Do
Kingfisher [1]	A O Meredith M D	Kingfisher	Do
LeFlore [1]	Rush L Wright M D	Poteau	Do
Logan [3]	C B Hill M D	Guthrie	Do
Muskogee [3]	G L Brooks M D	Muskogee	Do
Oklahoma [1]	George Hunter M D	Oklahoma	Do
Okmulgee [3]	M L Peter M D M P H	Okmulgee	Do
Payne [4]	C W Moore M D	Stillwater	Do
Pittsburg [3]	Paul T Powell M D	McAlester	Do
Pontotoc [3]	R H Mayes M D	Ada	Do
Pottawatomie [3]	Charles W Haygood M D	Shawnee	Do
Seminole [4]	Mack I Shannholtz M D, M P H	Wewoka	Do
Stephens [3]	Thomas M Berry M D	Duncan	Do
Tulsa [2]	R M Adams, M D	Tulsa	Do
District [5] Choctaw McCurtain	O G Gregg M D	Hugo	Do
District No 1 [5] Adair Cherokee Delaware Mayes Sequoyah	W M Wood M D	Tahlequah	Do
District No 3 [5] Beaver Cimarron Texas	James L Nicholson, M D	Guymon	Do
District No 4 [5] Beckham Custer Washita	Roy W Anderson M D	Clinton	Do
District No 5 [5] Johnston Love Marshall	Temporary vacancy	Madill	Do

Local health unit	Name of health officer	Post office address	Official title
Oregon			
Clackamas[1]	Dan P Trullinger M D	Oregon City	County health officer
Clatsop[1]	Donald J Bourg M D	Astoria	Do
Coos[1]	Temporary vacancy	Coquille	Do
Douglas[1]	do	Roseburg	Do
Jackson[1]	A Jean Merkel M D	Medford	Do
Josephine[1]	Samuel B Osgood M D D P H	Grants Pass	Do
Klamath[2]	Peter H Rozendal M D	Klamath	Do
Lane[2]	Clarence R Lindgren M D	Eugene	Do
Linn[1]	A Edward Bostrom M D D P H	Albany	Do
Marion[2]	Willard J Stone M D	Salem	Do
Multnomah[1]	I Sydney Hansen M D	Portland	Do
Portland[2]	Thomas L Meador M D M P H	do	City health officer
Umatilla[2]	Temporary vacancy	Pendleton	County health officer
Washington[1]	Frederick J Burke M D	Hillsboro	Do
Yamhill[1]	Hollister Stolte M D	McMinnville	Do
District[5] Baker Union	Elizabeth Bishop M D M P H	Baker	Do
District[5] Benton Polk	Temporary vacancy	Corvallis	Do
District[5] Crook Deschutes Jefferson	Frederick P [illegible] M D (U S Public Health Service)	Bend	Do
District[5] Sherman Wasco	Temporary vacancy	The Dalles	Do
Pennsylvania			
District No 1[4] Luzerne	William F Davison M D	Wilkes Barre	District medical director
District No 2[4] Armstrong Indiana Jefferson	Charles F Rink M D	Indiana	Acting district medical director
District No 3[4] Greene Washington	Arthur W Hopper M D	Washington	District medical director
District No 4[4] Bucks Montgomery	Thomas M Thompson M D M P H	Norristown	Do
District No 5[4] Allegheny	A M Williams M D M P H	Pittsburgh	Do
District No 6[4] Fayette	Temporary vacancy	Uniontown	Do
District No 7[4] Chester Delaware	Thomas M Thompson M D	Chester	Acting district medical director
District No 8[4] Beaver Butler Lawrence	Donald H Eckles M D M P H	New Castle	District medical director
District No 9[4] Centre Clinton	Temporary vacancy	Philipsburg	Do.
District No 10[4] Blair Cambria Huntingdon	George R Good M D M P H	Altoona	Do
Rhode Island			
Providence[2]	Michael J Nestor M D	Providence	Superintendent of health
Woonsocket[2]	James P O Brien M D	Woonsocket	Health officer
Northern District[4] Providence (excluding 5 municipalities)	do	do	District health officer.
Southern District[4] Kent (excluding city of Warwick) Washington	Raymond F McAteer M D	West Warwick	Do
Southeastern District[4] Bristol Newport	Joseph Castronovo M D	Bristol	Do

Local health unit	Name of health officer	Post office address	Official title
South Dakota:			
Pennington [3]	Irving Howard Mauss, M. D. (U. S. Public Health Service).	Rapid City	Director.
Sioux Falls [3]	Francis Hamilton Redewill, Jr., M. D., M. S. P. H. (U. S. Public Health Service).	Sioux Falls	Do.
Tennessee:			
Anderson [1]	Temporary vacancy	Clinton	Health officer.
Davidson [1]	J. J. Lentz, M. D	Nashville	Do.
Fayette [1]	J. T. Nardo, M. D	Somerville	Do.
Gibson [1]	M. D. Ingram, M. D	Trenton	Do.
Hamilton [3]	F. O. Pearson, M. D., M. P. H	Chattanooga 2	Do.
Hardeman [1]	R. L. Cobb, M. D	Bolivar	Do.
Hickman [1]	Temporary vacancy	Centerville	Do.
Humphreys [1]	do	Waverly	Do.
Knox [3]	W. H. Ennels, M. D	Knoxville 7	Do.
Madison [3]	L. A. Byers, M. D., M. P. H	Jackson	Do.
Maury [1]	H. C. Busby, M. D., M. P. H	Columbia	Do.
Montgomery [3]	F. J. Malone, M. D	Clarksville	Do.
Nashville [3]	T. V. Woodring, M. D	Nashville 10	Do.
Roane [1]	J. C. Fly, M. D	Kingston	Do.
Rutherford [1]	J. B. Black, M. P. H., D. P. H	Murfreesboro	Do.
Shelby [3]	L. M. Graves, M. D	Memphis 3	Do.
Sullivan [3]	J. E. Williams, M. D	Blountville	Do.
Sumner [1]	W. M. Dedman, M. D., M. P. H	Gallatin	Do.
Washington [3]	R. O. Ingham, M. D., M. P. H	Jonesboro	Do.
Weakley [1]	M. R. Beyer, M. D	Dresden	Do.
Williamson [1]	W. B. Farris, M. D	Franklin	Do.
Wilson [1]	R. C. Kash, M. D., M. P. H	Lebanon	Do.
District [5]	H. M. Roberson, M. D	Pikeville	Do.
Bledsoe			
Rhea			
Sequatchie			
District [5]	W. N. Dawson, M. D., M. P. H		Do.
Blount		Maryville	
Sevier		Sevierville	
District [5]	James W. Chapman, M. D., M. P. H.		Do.
Bradley		Cleveland	
McMinn		Athens	
District [5]	W. H. Walcott, M. D. (U. S. Public Health Service).		
Carroll		Huntingdon	
Henry		Paris	
District [5]	W. O. Bingham, M. D	Elizabethton	Do.
Carter			
Johnson			
Unicoi			
District [5]	M. G. Fisher, M. D		Do.
Cocke		Newport	
Grainger		Morristown	
Hamblen		do	
District [5]	W. G. Shelton, M. D	Dyersburg	Do.
Crockett			
Dyer			
District [5]	D. M. Cowgill, M. D., M. P. H		Do.
Giles		Pulaski	
Lincoln		Fayetteville	
District [5]	R. S. Cowles, M. D		Do.
Greene		Greeneville	
Hawkins		Rogersville	
District [5]	George James, M. D	Union City	Do.
Lake			
Obion			
District [5]	W. C. Ramer, M. D		Do.
Lauderdale		Ripley	
Tipton		Covington	
District [5]	Myrtle Lee Smith, M. D	Lafayette	Do.
Macon			
Trousdale			
Camp Forrest District. [5]	H. A. Morgan, Jr., M. D., M. P. H.	Manchester	Director.
Bedford			
Coffee			
Franklin			
Grundy			
Marshall			
Moore			
Warren			
Texas:			
Bexar [1]	M. M. Dorbandt, M. D	San Antonio	Do.
Bowie [3]	Earl H. Smith, M. D. (U. S. Public Health Service).	Texarkana	Do.
Brazos [3]	T. E. Dodd, M. D., M. P. H	Bryan	Do.
Brown [3]	C. W. Kelley, M. D	Brownwood	Do.

Local health unit	Name of health officer	Post office address	Official title
Texas—Continued.			
Cameron [3]	Grady Deaton, M. D	San Benito	Director.
Cass [1]	Temporary vacancy	Linden	Do.
Collin [1]	W. L. Kitchens, M. D	McKinney	Do.
Dallas [1]	J. M. Pickard, M. D	Dallas	Do.
Dallas [2]	J. M. Dowis, M. D	do	Acting director.
Fort Worth [2]	H. M. Williams, M. D	Fort Worth	Acting director of public welfare.
Harris [1]	A. M. Clarkson, M. D., C. P. H	Houston	Director.
Hidalgo [3]	Joe W. May, M. D	Edinburg	Do.
Houston [2]	Austin E. Hill, M. D., M. P. H	Houston	Do.
Hunt [3]	Ralph W. Jenks, M. D	Greenville	Do.
Jim Wells [1]	H. H. Puckett, M. D	Alice	Do.
Lamar [3]	Francis E. Dill, M. D. (U. S. Public Health Service).	Paris	Do.
McLennan [3]	Paul L. Wermer, M. D	Waco	Do.
Navarro [3]	F. E. Sadler, M D	Corsicana	Do.
San Antonio [2]	Temporary vacancy	San Antonio	Do.
San Augustine [1]	John Schreiber, M. D	San Augustine	Do.
Smith [3]	H. C. Wilson, M. D	Tyler	Do.
Tarrant [1]	W B. Nics, M. D	Fort Worth	Do.
Upshur [1]	Ralph E. Barnes, M. D	Gilmer	Do.
Wichita [3]	Lewis C Robbins, M D, M P H. (U S. Public Health Service)	Wichita Falls	Do.
District [4]	J. M. Coleman, M. D., M. P. H	Austin	Do.
Bastrop			
Travis			
District [4]	C. M. Covington, M. D	Belton	Do.
Bell			
Burnet			
Coryell			
Lampasas			
Llano			
Williamson			
District [4]	E. S. Freeman, M. D		Do.
Brazoria		Angleton	
Calhoun		El Campo	
Jackson		do	
Matagorda		do	
Victoria		do	
Wharton		do	
District [4]	H. H. Terry, M. D., Ph G		Do.
Cooke		Gainesville	
Grayson		Sherman	
District [4]	Walter Breedlove	Brownfield	Acting director.
Dawson			
Gaines			
Hockley			
Terry			
Yoakum			
District [4]	J. A. Olean, M D. (U. S. Public Health Service).	Midland	Director.
Ector			
Howard			
Midland			
District [4]	W. B. Prothro, M. D		Do.
El Paso		El Paso	
Hudspeth		do	
Kleberg		Corpus Christi	
Nueces		do	
District [4]	W. E. Cox, M. D	Woodville	Do.
Hardin			
Tyler			
District [4]	R. S. Lloyd, M. D	Jasper	Do.
Jasper			
Newton			
District [4]	Elton S. Osborne, Jr., M. D. (U. S. Public Health Service).		Do.
Jefferson		Port Neches	
Orange		Orange	
District [4]	Paul G. Capps, M. D	Uvalde	Do.
Kinney			
Maverick			
Uvalde			
Zavala			
District [4]	T. E. Crump, M. D	Cameron	Do.
Milam			
Robertson			
District [4]	W. R. Ross, M. D		Do.
Nolan		Sweetwater	
Taylor		Abilene	
District [4]	George G. Howard, M. D. (U. S. Public Health Service).	Mineral Wells	Do.
Palo Pinto			
Parker			

Local health unit	Name of health officer	Post office address	Official title
Utah			
Davis [1]	D Keith Barnes M D	Farmington	County health officer
District No 1 [4]	Donald J Bourg M D	Ogden	District health officer
Box Elder			
Cache			
Daggett			
Morgan			
Rich			
Summit			
Weber			
District No 2 [4]	Temporary vacancy	Cedar City	Do
Beaver			
Garfield			
Iron			
Kane			
Piute			
Washington			
District No 3 [4]	Edward L Van Aelstyn M D	Price	Do
Carbon			
Emery			
Grand			
San Juan			
District No 4 [4]	Temporary vacancy	Provo	Do
Duchesne			
Salt Lake			
Tooele			
Uintah			
Utah			
Wasatch			
District No 5 [4]	Roy H Wilson M D	Richfield	Do
Juab			
Millard			
Sanpete			
Sevier			
Wayne			
Virginia			
Albemarle [1]	T S Englar M D M P H	Charlottesville	Health officer
Arlington [1]	R G Beachley M D D P H	Arlington	Director of health and welfare
Charlotte [1]	William R Martin M D	Charlotte C H	Health officer
Chesterfield [1]	F C Gates M D M P H	Chesterfield	Do
Hanover [1]	J D Hammer Jr M D M P H	Ashland	Do
Henrico [1]	J H Crouch M D, M P H	R F D 14 Box 294 Richmond	Do
Loudoun [1]	C F Waller M D	Leesburg	Do
Northampton [1]	William Y Garrett M D M P H	Eastville	Do
Orange [1]	Lewis Holladay M D	Orange	Acting health officer
Rockbridge [1]	R I Cocke M D	Lexington	Health officer
District [5]	Temporary vacancy	Covington	Do
Alleghany			
Botetourt			
District [5]	Thomas Scarlett M D	Harrisonburg	Do
Augusta			
Rockingham			
District [5]	I H Valentine M D	Lawrenceville	Do
Brunswick			
Greensville			
Mecklenburg			
District [5]	Paul T Bundy M D	Richlands	Do
Buchanan			
Tazewell			
District [5]	Francis J Clements M D	Stony Creek	Do
Dinwiddie			
Prince George			
Sussex			
District [5]	W W Fuller M D M P H	Williamsburg	Do
Elizabeth City			
James City			
Warwick			
York			
District [5]	Nelson Podolnick M D (U S Public Health Service)		Do
Fairfax			
Prince William			
Stafford			
District [5]	A Glenn Evans M D M P H	Christiansburg	Do
Giles			
Montgomery			
District [5]	D C Steelsmith, M D M P H	South Boston	Do
Halifax			
Pittsylvania			

Local health unit	Name of health officer	Post office address	Official title
Virginia—Continued			
District [5] Isle of Wight, Nansemond, Southampton	H D Crow M D	Suffolk	Health officer
District [5] Norfolk, Princess Anne	F L Langs M D (U S Public Health Service)	Portsmouth	Do
District [5] Page, Shenandoah, Warren	M E McRae, M D	Luray	Do
District [5] Pulaski, Wythe	T F McGough M D	Pulaski	Do
District [5] Russell, Wise	Linwood Farley M D	Norton	Do
Southside District [5] Buckingham, Cumberland, Nottoway, Prince Edward	J N Dudley, M D M P H	Farmville	Do
District [5] Smyth, Washington	Catherine W R Smith M D (U S Public Health Service)	Abingdon	Do
Washington			
Clark [4]	S P Lehman M D M P H	Vancouver	County health officer
Grant [1]	Jess B Spielholz M D M P H (U S Public Health Service)	Ephrata	Do
King [1]	W W Schwabland M D	Seattle	Do
Kitsap	Russell H Wilson M D (U S Public Health Service)	Bremerton	District health officer
Pierce [1]	N F Magnussen M D	Tacoma	County health officer
Seattle	Ragnar T Westman M D D P H	Seattle	Commissioner of health
Snohomish [1]	Charles D Muller Jr M D	Everett	County health officer
Spokane [2]	Ralph Hendricks M D	Spokane	City health officer
Spokane [1]	A I Tien M D M P H	do	County health officer
Tacoma [2]	C R Fargher M D M P H	Tacoma	Director of health
Whitman [1]	Philip J Holabach M D	Colfax	County health officer
Yakima [3]	Stanley R Benner M D	Yakima	County city health officer
District [5] Benton, Franklin, Walla Walla	A I Ringle M D M P H	Walla Walla	District health officer
District [5] Chelan, Douglas	Paul T West M D	Wenatchee	Do
District [5] Clallam, Jefferson	Emil F Palmquist M D M P H	Port Angeles	Do
District [5] Cowlitz, Wahkiakum	I H Biggs M D	Kelso	Do
District [5] Lewis, Pacific	Robert H Fishbach M D (U S Public Health Service)	Chehalis	Do
District [5] Mason, Thurston	J B Jason M D M P H	Olympia	Do
West Virginia			
Berkeley [1]	H R DuPuy M D	Martinsburg	County health officer
Boone [1]	R I Hunter M D	Madison	Do
Fayette [1]	J F Coleman M D	Fayetteville	Do
Harrison [1]	A J Kemper M D	Clarksburg	Do
Kanawha [1]	A M Price M D	Charleston	Do
Logan [1]	W P Hamilton M D, M P H	Logan	Do
Marion [1]	Temporary vacancy	Fairmont	Do
Marshall [1]	W G C Hill M D	Moundsville	Do
Monongalia [1]	William B Baily M D (U S Public Health Service)	Morgantown	Do
Ohio [1]	A J Niehaus M D	Wheeling	Do
Preston [1]	C Y Moser M D	Kingwood	Do
Raleigh [1]	W W Hume M D	Beckley	Do
Wetzel [1]	M A Viggiano, M D	New Martinsville	Do

Local health unit	Name of health officer	Post office address	Official title
West Virginia Con			
District No 1[4]	W J Riley, M D	Sutton	District health officer
Braxton			
Clay			
Nicholas			
Webster			
District No 2[4]	Herbert Duncan M D	Lewisburg	Do
Greenbrier			
Monroe			
Pocahontas			
District No 3[5]	Blinn A Buell M D (U S Public Health Service)	Point Pleasant	Do
Jackson			
Mason			
Putnam			
Roane			
District No 4[4]	C A Thomas M D	Weston	Do
Calhoun			
Gilmer			
Lewis			
Upshur			
Wisconsin			
Appleton[2]	F J Huberty M D	Appleton	City health officer
Eau Claire[2]	Temporary vacancy	Eau Claire	County city health officer
Fond du Lac[2]	J J Rehorst M D	Fond du Lac	City health officer
Green Bay[2]	George M Shinners M D	Green Bay	Do
Janesville[2]	Fred B Welch M D	Janesville	Do
Kenosha[2]	A J Randall M D	Kenosha	Do
La Crosse[2]	A M Murphy	La Crosse	Do
Madison[2]	F F Bowman M D	Madison	Do
Marathon[1]	Glenn Hough M D	Wausau	County health officer
Milwaukee[2]	E R Krumbiegel M D	Milwaukee	Commissioner of public health
Oshkosh	W P Wheeler M D	Oshkosh	City health officer
Racine[2]	I F Thompson M D	Racine	Do
Rock	Margaret Hatfield M D	Janesville	County health officer
Sheboygan[2]	G J Hildebrand M D	Sheboygan	City health officer
Superior[2]	C H Mason M D	Superior	Do
West Allis[2]	F V Brumbaugh M D	West Allis	Do
Wausau[2]	I J Bugbee	Wausau	Do
District No 1[4]	Arthur R Zintek M D	Madison	District health officer
Columbia			
Crawford			
Dane			
Grant			
Green			
Iowa			
Lafayette			
Richland			
Sauk			
District No 2[4]	R N Nelson M D	Elkhorn	Do
Jefferson			
Kenosha			
Milwaukee			
Racine			
Walworth			
Waukesha			
District No 3[4]	V A Gudex M D	Fond du Lac	Do
Calumet			
Dodge			
Fond du Lac			
Manitowoc			
Ozaukee			
Sheboygan			
Washington			
Winnebago			
District No 4[4]	Temporary vacancy	Sparta	Do
Adams			
Green Lake			
Juneau			
La Crosse			
Marquette			
Monroe			
Vernon			
Waushara			
District No 5[4]	Arthur Van Duser M D	Wisconsin Rapids	Do
Buffalo			
Clark			
Jackson			
Marathon			
Pepin			
Portage			
Trempealeau			
Wood			

Local health unit	Name of health officer	Post office address	Official title
Wisconsin—Con.			
District No. 6 [4]	M. W. Meyer, M. D., M. S. P. H.	Green Bay	District health officer.
Brown			
Door			
Kewaunee			
Marinette			
Oconto			
Outagamie			
Shawano			
Waupaca			
District No. 7 [4]	F. P. Daly, M. D.	Chippewa Falls	Do.
Barron			
Chippewa			
Dunn			
Pierce			
Polk			
Rusk			
St. Croix			
District No. 8 [4]	Frances Cline, M. D., M. S. P. H.	Rhinelander	Do.
Florence			
Forest			
Langlade			
Lincoln			
Oneida			
Price			
Taylor			
Vilas			
District No. 9 [4]	Temporarily vacant	Ashland	Do.
Ashland			
Bayfield			
Burnett			
Douglas			
Iron			
Sawyer			
Washburn			
Wyoming			
Laramie [3]	Phillip V. Ketchum, M. D.	Cheyenne	

DEATHS DURING WEEK ENDED SEPTEMBER 2, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 2, 1944	Corresponding week, 1943
Data for 92 large cities of the United States:		
Total deaths	7,591	7,91[illegible]
Average for 3 prior years	7,736	
Total deaths, first 35 weeks of year	318,961	325,413
Deaths under 1 year of age	613	609
Average for 3 prior years	[illegible]93	
Deaths under 1 year of age, first 35 weeks of year	21,642	23,411
Data from industrial insurance companies:		
Policies in force	66,719,611	6[illegible],793,239
Number of death claims	11,[illegible]94	10,6[illegible]6
Death claims per 1,000 policies in force, annual rate	9.4	8.4
Death claims per 1,000 policies, first 35 weeks of year, annual rate	10.2	9.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 9, 1944

Summary

For the first time since early in June, a decrease occurred in the weekly reported incidence of poliomyelitis. A total of 1,498 cases was reported, as compared with 1,682 last week, 906 for the corresponding week last year, and a 5-year (1939–43) median of 585.

Decreases occurred in all geographic sections except the West North Central, South Central, and Mountain areas. Increases were reported in only 6 of the 16 States reporting 20 or more cases each, as follows (last week's figures in parentheses): Increases—Massachusetts 42 (35), Illinois 45 (37), Minnesota 48 (40), Iowa 25 (7), Virginia 67 (65), West Virginia 24 (14); *decreases*—New York 581 (666), New Jersey 50 (67), Pennsylvania 130 (162), Ohio 92 (105), Indiana 23 (27), Michigan 75 (120), Wisconsin 20 (32), Maryland 32 (47), North Carolina 27 (41), Kentucky 33 (34).

The total number of cases reported to date is 10,973, as compared with 6,762 for the same period last year, a 5-year median of 4,059, and 8,928 for the same period in 1931, for which year a total of 15,745 cases was reported. In 1931 the peak of incidence occurred during the week ended September 5.

Although continuing high, the incidence of meningococcus meningitis declined. A total of 110 cases was reported, as compared with 123 for the preceding week, 173 for the corresponding week last year, and a 5-year median of 44. States reporting more than 6 cases are New York (17), California (12), and Pennsylvania (11).

Slight increases were reported for diphtheria, influenza (chiefly in Texas, Virginia, and South Carolina), scarlet fever, and typhoid fever, but current figures for all of these diseases except influenza are below both those for the corresponding week last year and the 5-year median. Figures for whooping cough, both current and cumulative,

are very much lower than corresponding figures for any of the past 5 years. Four cases of smallpox were reported for the week, bringing the total for the year to date to 309, as compared with 618 for the same period last year, and a median of 1,194 for the corresponding periods of the past 5 years.

A total of 7,673 deaths was recorded for the week in 93 large cities of the United States, as compared with 7,610 for the preceding week and a 3-year (1941–43) average of 7,511. The cumulative total is 327,682, as compared with 334,120 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended Sept. 9, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria, Week ended Sept 9 1944	Diphtheria, Week ended Sept 11 1943	Diphtheria, Median 1939-43	Influenza, Week ended Sept 9 1944	Influenza, Week ended Sept 11 1943	Influenza, Median 1939-43	Measles, Week ended Sept 9 1944	Measles, Week ended Sept 11 1943	Measles, Median 1939-43	Meningitis, meningococcus, Week ended Sept 9 1944	Meningitis, meningococcus, Week ended Sept 11 1943	Meningitis, meningococcus, Median 1939-43
NEW ENGLAND												
Maine	0	1	1				0	7	7	0	1	0
New Hampshire	0	0	0				0	0	0	0	0	0
Vermont	1	3	0				1	7	7	0	0	0
Massachusetts	2	1	1				13	52	34	3	13	1
Rhode Island	2	0	0	7			4	10	4	0	2	1
Connecticut	0	1	0		2	1	13	11	5	3	3	0
MIDDLE ATLANTIC												
New York	6	8	8	(1)	(1)	(1) 1	36	73	71	17	23	6
New Jersey	0	3	3	5	1	3	5	77	33	6	9	1
Pennsylvania	4	5	5	4			21	22	33	11	13	4
EAST NORTH CENTRAL												
Ohio	5	11	10	5	2	6	8	22	18	2	5	2
Indiana	11	4	4		1	4	1	18	5	1	3	0
Illinois	3	7	14		3	3	10	33	23	3	9	2
Michigan [2]	3	2	3		1	1	17	93	23	3	8	0
Wisconsin	0	0	0	6	10	15	27	90	51	2	5	1
WEST NORTH CENTRAL												
Minnesota	7	3	5			1	1	51	9	2	1	0
Iowa	1	4	3				2	3	4	1	5	0
Missouri	2	[illegible]	4		1	1	6	5	5	1	6	1
North Dakota	0	2	1		1	1	0	3	1	0	1	0
South Dakota	3	1	1				2	1	2	0	1	0
Nebraska	0	3	1	5	3		3	5	2	1	0	0
Kansas	4	3	3		4	2	4	3	3	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0				0	3	1	1	0	0
Maryland [2]	1	1	1	1			6	16	9	1	2	2
District of Columbia	0	0	1		1		2	4	4	1	2	0
Virginia	13	12	12	75	65	77	10	36	10	2	4	2
West Virginia	2	8	7	3		3	3	11	2	2	2	1
North Carolina	13	[illegible]	34				5	10	10	2	1	1
South Carolina	12	1	25	110	142	142	11	11	11	2	1	1
Georgia	8	19	23	13	1	14	2	6	2	5	1	1
Florida	5	6	6		2	2	12	4	4	1	0	0
EAST SOUTH CENTRAL												
Kentucky	[illegible]	4	5		2	1	2	4	6	3	1	1
Tennessee	4	14	14	1	6	6	4	4	17	1	6	2
Alabama	30	49	33	1	9	9	0	23	3	2	3	1
Mississippi [2]	13	10	10				0		0	3	5	1
WEST SOUTH CENTRAL												
Arkansas	9	7	13	18	3	3	0	3	5	1	1	0
Louisiana	9	5	5	2	6	5	0	2	2	0	4	1
Oklahoma	7	2	6	1	2	15	1	0	4	3	2	0
Texas	32	18	24	356	273	143	25	25	25	2	2	1
MOUNTAIN												
Montana	0	3	3	10		1	0	13	2	0	1	0
Idaho	0	0	0		1		2	0	0	0	0	0
Wyoming	0	0	0				4	14	3	0	0	0
Colorado	6	18	8	1	4	10	5	2	5	4	3	1
New Mexico	4	0	2	1			5	1	1	0	0	0
Arizona	1	0	0	17	21	21	2	2	3	0	3	1
Utah [2]	0	0	0			2	2	1	9	0	0	0
Nevada	1	0	0				0	6	0	1	0	0
PACIFIC												
Washington	2	3	1				11	5	8	3	1	1
Oregon	1	3	1	7		2	12	31	7	2	2	1
California	7	12	10	5	14	11	92	55	47	12	17	1
Total	239	314	321	654	581	581	392	881	576	110	173	44
36 weeks	7 428	8 010	8 431	340 323	83 394	152 791	592 714	510 027	468 385	[5] 13 481	14 018	1 514

[1] New York City only
[2] Period ended earlier than Saturday
[5] Cumulative total changed by corrected reports

Telegraphic morbidity reports from State health officers for the week ended Sept 9, 1944 and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Poliomyelitis: Week ended— Sept 9 1944	Poliomyelitis: Week ended— Sept 11 1943	Poliomyelitis: Median 1939-43	Scarlet fever: Week ended— Sept 9 1944	Scarlet fever: Week ended— Sept 11 1943	Scarlet fever: Median 1939-43	Smallpox: Week ended— Sept 9 1944	Smallpox: Week ended— Sept 11 1943	Smallpox: Median, 1939-43	Typhoid and paratyphoid fever[3]: Week ended— Sept 9 1944	Typhoid and paratyphoid fever[3]: Week ended— Sept 11 1943	Typhoid and paratyphoid fever[3]: Median 1939-43
NEW ENGLAND												
Maine	6	2	2	9	4	4	0	0	0	0	0	1
New Hampshire	6	0	0	0	2	2	0	0	0	0	0	0
Vermont	2	3	2	3	3	2	0	0	0	4	1	1
Massachusetts	42	23		48	58	31	0	0	0	4	7	2
Rhode Island	1	10	0	2	4	2	0	0	0	0	1	1
Connecticut	13	2	5	5	1	8	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	581	68	68	48	51	56	0	0	0	12	2	16
New Jersey	50	7	22	9	13	26	0	0	0	2	3	3
Pennsylvania	130	8	11	48	35	44	0	0	0	12	12	22
EAST NORTH CENTRAL												
Ohio	92	20	20	61	6	52	0	0	0	8	7	22
Indiana	23	16	11	19	15	16	0	0	0	2	4	7
Illinois	45	184	40	44	56	56	0	0	0	5	3	10
Michigan[2]	75	31	34	33	31	32	0	0	0	3	7	6
Wisconsin	20	14	6	24	44	44	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	48	14	14	19	18	18	0	0	0	1	0	0
Iowa	25	23	8	22	1[illegible]	13	1	0	0	0	1	2
Missouri	14	21	8	8	7	13	0	0	0	3	7	8
North Dakota	7	0	1	2	0	2	0	0	0	0	0	1
South Dakota	0	3	1	1	5	4	1	0	0	0	0	0
Nebraska	11	30	8	6	12	4	0	0	0	0	0	0
Kansas	7	4	6	18	21	24	0	0	0	3	2	2
SOUTH ATLANTIC												
Delaware	12	1	0	1	2	1	0	0	0	0	1	2
Maryland[2]	32	0	[illegible]	19	8	11	0	0	0	2	0	[illegible]
District of Columbia	17	2	2	9	1		0	0	0	0	1	1
Virginia	67		9	23	28	19	0	0	0	6	10	12
West Virginia	24	1	[illegible]	45	32	[illegible]	0	0	0	6	9	9
North Carolina	26	2	7	36	[illegible]	38	0	0	0	4	2	4
South Carolina	4	0	3	5		11	0	0	0		6	17
Georgia	1	1	1	6	12	16	0	0	0	5	5	15
Florida	4	0	0	8	2	[illegible]	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	33	8	8	14	10	21	0	0	0	5	11	13
Tennessee	10	2	3	13	28	28	1	2	0	1	9	24
Alabama	5	2	[illegible]	21	11	16	0	0	0	4	0	11
Mississippi[2]	9	0	1	12	6	9	0	0	0	5	12	10
WEST SOUTH CENTRAL												
Arkansas	0	1	1	5	0	3	0	0	0	9	3	12
Louisiana	5	3	3	1	5	4	0	0	0	15	[illegible]	15
Oklahoma	1	36	2	6	0	9	0	0	0	1	17	17
Texas	11	70	6	[illegible]	20	20	0	0	0	24	10	35
MOUNTAIN												
Montana	6	0	0	4	6	6	0	0	0	0	0	1
Idaho	0		0	1	3		0	0	0	3	0	1
Wyoming	0	3	0	0	3	1	0	0	0	0	0	0
Colorado	6	35	3	17	14	11	0	0	0	4	2	3
New Mexico	3	3	1	4	2	1	0	0	0	0	2	2
Arizona	0	7	2	1	3	1	0	0	0	0	4	3
Utah[2]	0	40	0	[illegible]	7	4	0	0	0	0	0	0
Nevada	0	3	0	1	2	0	0	0	0	0	0	0
PACIFIC												
Washington	7	7	2	18	17	11	1	0	0	0	1	2
Oregon	11	26	5	8	6	6	0	0	0	1	2	2
California	12	111	21	61	42	42	0	0	0	5	3	4
Total	1 498	906	585	705	804	804	4	2	[illegible]	166	194	355
36 weeks	[4]10 973	6 792	4 0[illegible]9	149 688	100 121	100 121	[4]309	618	1 194	[4]3 762	3 849	5 536

[2] Period ended earlier than Saturday
[3] Including paratyphoid fever reported separately as follows Massachusetts 2 Connecticut 1 New York, 2 Ohio 4 Michigan 1 Georgia 1 Florida 1 Arkansas 2 Louisiana 1
[4] Cumulative total changed by corrected reports

Telegraphic morbidity reports from State health officers for the week ended Sept 9, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Whooping cough: Week ended Sept 9 1944	Whooping cough: Week ended Sept 11 1943	Whooping cough: Median 1939–43	Week ended Sept 9 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	10	16	16	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	29	16	16	0	0	0	0	0	0	0	0	0
Massachusetts	55	53	81	0	0	4	0	0	0	0	0	0
Rhode Island	7	38	2[illegible]	0	0	0	0	0	0	0	0	0
Connecticut	53	34	44	0	0	4	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	121	204	2[illegible]0	0	4	40	0	0	0	0	0	0
New Jersey	44	115	11[illegible]	0	0	0	0	0	0	1	0	0
Pennsylvania	48	128	247	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	116	117	167	0	0	0	0	0	0	0	0	0
Indiana	24	68	5[illegible]	0	0	0	0	0	0	0	0	0
Illinois	109	171	227	0	1	2	0	1	0	0	0	0
Michigan [3]	47	209	1[illegible]0	0	0	5	0	0	0	0	0	0
Wisconsin	106	184	184	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	43	52	52	0	0	0	0	0	0	0	0	0
Iowa	[illegible]	35	2	0	0	0	0	0	0	0	0	0
Missouri	29	14	14	0	0	0	0	0	0	1	1	0
North Dakota	[illegible]	79	15	0	0	0	0	3	0	0	0	0
South Dakota	22	4	4	0	0	0	0	1	0	0	0	0
Nebraska	12	15	8	0	0	0	0	0	0	0	0	0
Kansas	32	20	20	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	2	2	0	0	0	0	0	0	0	0	0
Maryland [3]	78	71	47	0	0	0	0	0	0	5	0	0
District of Columbia	4	9	11	0	0	0	0	0	0	0	0	0
Virginia	41	119	71	0	0	0	349	0	0	6	0	1
West Virginia	13	28	11	0	0	0	0	0	0	0	0	0
North Carolina	94	80	80	0	0	0	0	0	0	1	0	8
South Carolina	67	63	36	0	0	28	0	0	0	0	1	6
Georgia	9	19	23	0	0	11	0	0	0	0	0	33
Florida	1	21	2	0	1	0	0	0	0	0	0	17
EAST SOUTH CENTRAL												
Kentucky	25	40	40	0	0	2	0	0	0	0	0	0
Tennessee	20	34	34	0	0	0	4	1	0	0	1	3
Alabama	8	1	14	0	0	0	0	1	0	1	0	45
Mississippi [2]				0	0	0	0	0	0	0	2	2
WEST SOUTH CENTRAL												
Arkansas	17	14	14	0	6	24	0	0	0	0	2	1
Louisiana	4	1	4	0	2	3	0	0	0	0	1	12
Oklahoma	2	9	8	0	0	0	0	0	0	0	0	0
Texas	126	134	127	0	14	312	7	1	0	0	0	39
MOUNTAIN												
Montana	73	7	8	0	0	0	0	0	0	1	1	0
Idaho	0	4	3	0	0	0	0	0	0	0	0	0
Wyoming	12	3	3	0	0	0	0	0	0	1	0	0
Colorado	30	61	23	0	0	10	0	7	0	0	0	0
New Mexico	11	11	6	0	0	2	5	0	0	0	0	0
Arizona	3	3	3	0	0	0	15	1	0	0	0	0
Utah [3]	15	50	25	0	0	0	0	0	0	1	1	0
Nevada	0	1	0	0	0	0	0	0	0	0	1	0
PACIFIC												
Washington	16	23	25	0	0	0	0	0	0	0	0	0
Oregon	17	39	20	0	0	0	0	0	0	0	0	0
California	47	72	114	0	2	14	0	1	0	0	0	4
Total	1 653	2 491	2 542	0	30	461	380	17	0	18	11	171
Same week 1943	2 491			3	60	482	390	28	0	8	14	159
Same week 1942	2,948			1	15	254	208	16	0	7	15	134
36 weeks 1944	68 301			31	[5] 1 209	15 621	[5] 6 020	459	20	407	408	3 262
36 weeks 1943	139 920			47	1 495	11 [illegible]78	5 620	503	19	389	629	2 628
36 weeks 1942	130 991		[4] 134 239	61	787	6 313	4 893	377	35	[4] 406	691	[4] 2,232

[3] Period ended earlier than Saturday
[4] 5 year median 1939–43
[5] Cumulative totals changed by corrected reports

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug 26, 1944

This table lists the reports from 87 cities of more than 10 000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	2	0	3	0	1	1
New Hampshire												
Concord	0	0		0	0	0	0	1	0	0	0	0
Massachusetts												
Boston	2	0		0	14	4	10	7	12	0	4	14
Fall River	0	0		0	0	0	0	0	0	0	0	0
Springfield	0	0		0	0	0	1	1	1	0	0	2
Worcester	0	0		0	0	0	1	0	3	0	0	3
Rhode Island												
Providence	1	0		0	0	0	1	1	2	0	0	0
Connecticut												
Bridgeport	0	0		0	0	0	0	2	0	0	0	0
Hartford	0	0		0	3	0	0	1	1	0	0	1
New Haven	0	0		0	0	1	0	1	1	0	0	5
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	1	3	61	0	0	1	1
New York	5	1		0	9	18	47	218	28		9	67
Rochester	0	0		0	1	0	1	16	0	0	0	2
Syracuse	0	0		0	0	0	0	8	2	0	0	9
New Jersey												
Camden	0	0		0	0	0	1	0	0	0	0	0
Newark	0	0			1	2	2	3	0	0	1	7
Trenton	0	0		0	0	0	3	1	1		0	0
Pennsylvania												
Philadelphia	0	0	3	1	4	2	15	34	5	0	1	8
Pittsburgh	1	0		0	0	2	7	15	3	0	1	9
Reading	0	0		0	0	0	1	2	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	1	0		0	0	2	0	15	9	0	0	21
Cleveland	1	0		0	0	2	8	24	5	0	0	14
Columbus	0	0		0	0	0	0	1	2	0	0	11
Indiana												
Fort Wayne	0	0		0	0	0	1	1	0	0	0	0
Indianapolis	1	0		0	0	2	1	2	1	0	0	3
South Bend	0	0		0	0	0	0	0	0	0	0	0
Terre Haute	0	0		0	0	0	3	0	0	0	0	0
Illinois												
Chicago	1	0		0	4	7	12	15	12	0	1	48
Michigan												
Detroit	1	0	1	0	8	1	5	40	10	0	2	40
Flint	0	0		0	0	0	5	6	1	0	0	6
Grand Rapids	0	0		0	0	1	0	1	0	0	0	2
Wisconsin												
Kenosha	0	0	0	0	0	0	0	0	0	0	0	14
Milwaukee	0	0		1	4	1	4	12	2	0	0	32
Racine	0	0		0	2	0	0	0	0	0	0	8
Superior	0	0		0	2	0	0	0	1	0	0	1
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	0	12	1	0	0	5
Minneapolis	1	0		0	1	1	0	18	2	0	0	1
St Paul	0	0		0	2	0	1	19	1	0	0	21
Missouri												
Kansas City	1	0		0	0	1	4	1	3	0	1	1
St Joseph	0	0		0	0	0	0	0	0	0	0	0
St Louis	0	0	2	1	3	6	4	6	2	0	1	12
North Dakota												
Fargo	0	5	-	0	0	0	1	6	0	0	0	0

City reports for week ended Aug. 26, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Nebraska												
Omaha	0	0		0	1	0	1	1	0	0	0	0
Kansas												
Topeka	0	0		0	1	0	0	0	0	0	0	5
Wichita	0	0		0	0	0	1	2	3	0	0	2
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	1	0	3	3	0	0	1	3
Maryland												
Baltimore	3	0		0	1	1	10	12	4	0	0	55
Cumberland	0	0		0	0	0	0	1	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		1	1	0	5	27	2	0	2	2
Virginia												
Lynchburg	0	0		0	0	0	0	11	0	0	0	1
Richmond	2	0		0	1	0	3	2	0	0	1	0
Roanoke	0	0		0	0	0	0	2	0	0	0	
West Virginia												
Charleston	0	0		0	0	0	0	1	0	0	0	0
Wheeling	0	0		0	0	0	0	0	0	0	0	1
North Carolina												
Raleigh	0	0		0	0	0	0	0	0	0	0	1
Wilmington	1	0		0	0	0	2	1	0	0	0	3
South Carolina												
Charleston	0	0		0	0	0	0	0	0	0	1	1
Georgia												
Atlanta	0	0	2	0	0	0	0	1	2	0	0	1
Brunswick	0	0		0	0	0	0	0	1	0	0	0
Savannah	0	0		0	0	1	0	0	0	0	0	3
Florida												
Tampa	0	0		0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0		0	0	1	3	0	0	0	0	19
Nashville	0	0		0	0	0	1	0	1	0	0	1
Alabama												
Birmingham	0	0		0	0	0	2	1	1	0	2	5
Mobile	0	0		0	0	0	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	1	0	0	0	0	5
Louisiana												
New Orleans	1	0		0	0	1	4	5	1	0	0	0
Shreveport	1	0		0	0	0	2	0	1	0	0	0
Texas												
Dallas	1	0		0	0	0	2	0	0	0	0	12
Galveston	0	0		0	0	0	1	0	0	0	0	0
Houston	0	1		0	0	1	6	0	0	0	3	1
San Antonio	0	0		0	0	0	1	0	0	0	1	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	1	0	0	1
Great Falls	0	0		0	0	0	0	0	1	0	0	0
Helena	0	0		0	0	0	0	0	1	0	0	1
Missoula	0	0		0	0	0	0	0	0	0	0	5
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	5	0		2	0	1	3	2	3	0	0	6
Pueblo	0	0		0	0	0	2	0	0	0	1	0
Utah												
Salt Lake City	0	0		0	0	0	0	0	4	0	0	5

City reports for week ended Aug 26, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis meningococcus cases	Pneumonia deaths			Typhoid and typhoid fever
			Cases	Deaths						
PACIFIC										
Washington										
Seattle	0	0		0	0	0	5	0		3
Spokane	0	0		0	5	0	1	0		0
Tacoma	0	0		0	0	1	0	0		0
California										
Los Angeles	7	0	1	0	8	1	2	2		5
Sacramento	0	0		0	2	0	2	2		2
San Francisco	4	0		0	31	1	0	0		4
Total	42	7	9	6	110	63	211	627		524
Corresponding week 1943	41		20	5	264		202		19[illegible]	1 019
Average, 1939 43	45		29	[1] [illegible]	[2] 21[illegible]		[1] 215		190	1 059

[1] 3 year average 1941 43
[2] 5 year median

Dysentery, amebic—Cases Boston 1 New York 2 St Louis 1
Dysentery bacillary Cases New York 2 Chicago 2 Detroit 6 Atlanta 1 Little Rock, 1, Shreveport, 2 Dallas 1 Los Angeles 5 Sacramento 1
Dysentery unspecified Cases Baltimore 2 Richmond 1 Shreveport 1
Rocky Mountain spotted fever Cases St Louis 2 Richmond 1
Typhus fever endemic—Cases Milwaukee 1 Wilmington N C 2 Charleston S C 1 Savannah 6 Tampa 1 Nashville, 1 Birmingham 7 Mobile 4 Little Rock 1 New Orleans 5, Houston, 4, San Antonio, 3

Rates (annual basis) per 100 000 population by geographic groups for the 87 cities in the preceding table (estimated population 1943, 34,345,100)

	Diphtheria case rates	Encephalitis in fectious case rates	Influenza		Measles case rates	Meningitis menin gococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and para typhoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7 9	0 0		0 0	45	13 1	33 4	36 8	60	0 0	13 1	6[illegible]
Middle Atlantic	2 8	0 5	1 4	0 5	7	11 6	37 0	16 7	18	0 0	6 0	1[illegible]
East North Central	3 1	0 0	0 6	0 6	12	9 8	23 3	71 6	26	0 0	1 8	12[illegible]
West North Central	4 0	9 9	4 0	2 0	10	15 9	23 9	129 3	24	0 0	4 0	94
South Atlantic	10 0	0 0	3 3	1 7	7	3 3	41 8	101 9	15	0 0	8 4	12[illegible]
East South Central	5 9	0 0		0 0	0	5 9	47 2	5 9	12	0 0	11 8	14[illegible]
West South Central	3 6	2 9		0 0	0	5 7	48 8	14 3	6	0 0	11 5	5[illegible]
Mountain	39 7	0 0		15 9	0	7 9	47 7	15 9	79	0 0	7 9	14[illegible]
Pacific	17 1	0 0	1 60	0 0	73	4 7	15 3	6 3	43	0 0	1 6	2[illegible]
Total	6 4	1 1	1 4	0 9	17	9 6	32 2	95 7	25	0 0	5 5	8[illegible]

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—July 1944—During the month of July 1944, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	13		3		6		1		23	
Diphtheria	4						2		6	
Dysentery (amebic)			2				12		14	
Dysentery (bacillary)	1				4		2		7	
Leprosy			1					1	1	1
Malaria [1]	27		5		151		107	8	290	8
Measles					1				1	
Mumps	2				4		2		8	
Paratyphoid fever					4		1		5	
Pneumonia		7		5	22	2		1	[2] 22	15
Tuberculosis		26		7	5			8	[2] 5	41
Whooping cough					1				[2] 1	

[1] 18 recurrent cases

[2] In the Canal Zone only

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 12, 1944.—During the week ended August 12, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		2	1	25	42	11	5	31	19	136
Diphtheria	1	5	2	23	3	3				37
Dysentery (bacillary)				1					21	22
German measles				2	24		1		4	31
Influenza		7			7				2	16
Measles		1	1	135	37	17	12	37	9	249
Meningitis, meningococcus				3	1		1	1		6
Mumps				13	20	2	5	26	5	71
Poliomyelitis		1	4	1	[1] 10	6	2	10		[1] 34
Scarlet fever			4	30	35	11	4	27	15	126
Tuberculosis (all forms)		2	1	130	46	22		51	55	307
Typhoid and paratyphoid fever				32	11		1		6	50
Undulant fever		1			1					2
Whooping cough		20		41	39	14	8	13	21	156

[1] Includes 1 case, delayed report

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

China—Kiangsi Province—Nancheng.—According to information dated August 23, 1944, an epidemic of bubonic plague was reported in Nancheng, Kiangsi Province, China.

Egypt—Port Said.—For the week ended August 19, 1944, 3 cases of plague and 5 deaths from the same disease were reported in Port Said, Egypt.

French West Africa—Dakar.—From the beginning of the outbreak in April 1944 to August 24, 1944, a total of 251 cases of plague with 217 deaths was reported in Dakar, French West Africa. These

figures include 52 cases of plague with 38 deaths reported for the period August 1–10, 1944.

India—Cochin (British).- Under date of August 31, 1944, plague was reported present in the municipal area of British Cochin, India.

Morocco (French)— Casablanca.—For the period August 1–10, 1944, 3 cases of plague were reported in Casablanca, French Morocco.

Tunisia.—On August 29, 1944, plague was reported present in Bizerte, Ferryville, and Tunis, Tunisia.

Smallpox

French Equatorial Africa.—For the month of June 1944, 204 cases of smallpox with 28 deaths were reported in French Equatorial Africa.

Italy.—Smallpox has been reported in Italy as follows: Naples—2 weeks ended July 31, 1944, 48 cases, 1 death; week ended August 7, 1944, 22 cases, 1 death; Palermo—July 1–31, 1944, 139 cases.

Typhus Fever

Hungary.—For the period August 1–12, 1944, 75 cases of typhus fever (including 18 cases in Subcarpathia) were reported in Hungary.

Morocco (French).- For the month of July 1944, 320 cases of typhus fever were reported in French Morocco.

Slovakia.—For the 3 weeks ended July 22, 1944, 15 cases of typhus fever were reported in Slovakia.

Yellow Fever

Belgian Congo.—For the week ended July 29, 1944, 1 case of yellow fever with 1 death was reported in Belgian Congo, no location being given.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. St. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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ANTI-PLAGUE MEASURES IN TACOMA, WASHINGTON

By JAMES M. HUNDLEY, *Assistant Surgeon,* and KAARLO W. NASI, *Assistant Sanitary Engineer, United States Public Health Service* [1]

Bubonic plague, that rat-borne scourge of mankind, is not unknown in the Puget Sound area. A human case of plague was found on a vessel in Port Townsend in 1900, and three human cases occurred in Seattle in 1907. Plague-infected rats were discovered intermittently in that city until 1917. After that, for a quarter of a century, there were no indications of plague in any city on the Sound.

DISCOVERY OF PLAGUE IN TACOMA

Until the autumn of 1942, this panic disease had never appeared in Tacoma. In that year a United States Public Health Service mobile unit visited Tacoma in the course of a routine check for the presence of plague infection. It was engaged in securing samples from various parts of western Washington. From September 22 to 26, and October 9 to 10, this unit trapped 257 rats near two large flour mills on the western water front of Tacoma harbor.

Fleas and other ectoparasites were removed from these rats and shipped to the United States Public Health Service Laboratory for Plague Investigations in San Francisco, Calif. By means of animal inoculation and bacteriologic analysis, seven specimens yielded organisms which were positively identified on October 23, 1942, as *Pasteurella pestis.*

ENVIRONMENT

The presence of plague foci anywhere is a serious threat to the health of the community. This is particularly true of Tacoma. The city is especially vulnerable to the spread of infection because of its situation, size, and the presence of many old frame buildings. It is built around a projection of Puget Sound called Commencement Bay

[1] From the Office of Plague Suppressive Measures, San Francisco, Calif.

which provides a spacious protected harbor with accommodations for many ocean-going ships.

Almost all of the industrial section is concentrated along the water front and near the tideflats at the southern end of the harbor. The business section is near the harbor's western water front. Residential sections are located principally to the west and south of the bay.

Except in the business section, a large majority of Tacoma's buildings are of wood, especially those used for industrial purposes. Most of them have been in operation for many years. The consequent deterioration, plus the frame construction, affords abundant rat harborage in almost all sections of the city. Because of the influx of population and resultant overcrowding, there was danger of the infection spreading to humans.

During the war, Tacoma has become the center of a critical war-production area. There is a large concentration of military forces in nearby cantonments. The city is the second largest of the Puget Sound ports, with an estimated population of 138,000. Rail and water shipping are active.

In early days, the economic life of the community centered in the lumbering industry. In later years, industrial activity became more diversified. Fishing and canning assumed importance. Today there are flour and feed mills as well as sawmills. Not only plywood and lumber fabrication factories, but factories for aircraft subassembly, and salt, chemical, and aluminum ingot production plants contribute to the wartime activities of Tacoma. Shipyards are especially important.

ORIGIN OF THE INFECTION

In so large and busy an area the source of the outbreak was difficult to determine. It will probably remain a controversial question because there are not enough facts to establish any one of the various theories. It might be assumed that the plague had been present in Tacoma for many years. This possibility cannot be dismissed entirely.

From 1915 to 1918, during the time plague was present in Seattle, several surveys were made in Tacoma without finding evidence of the disease. So far as is known no adequate surveys were made after 1918. It seems likely that human cases would have developed if the infection had been prevalent for any length of time.

According to the records, no human case of plague has ever occurred in Tacoma. In the autumn of 1942, when there was a heavy infection of rats and their fleas in areas where considerable numbers of people were present, it seems strange at first glance that cases of human infection did not occur. A close study of the situation, however, reveals several reasons why the plague was confined to rats.

The fact that a vigorous control campaign was instituted promptly after the infection was discovered probably contributed in no small measure to the prevention of human plague. Although in a few instances other rats were carrying the infected fleas, the infection was confined to the Norway rat which lives in ground burrows or other places with which man does not have intimate contact. The principal infected areas were the industrial sections where few people were present during the night when rats are most active. Another factor was the occurrence of the acute outbreak at the beginning of the rainy season which is considered to be unfavorable to the propagation of fleas.

Nosopsyllus fasciatus, the predominant flea involved, is known to be an efficient vector of plague because it was the major species responsible for the San Francisco epidemic in 1907. It also has been proved to be an efficient vector in animal experimentation. But in the Tacoma outbreak the average number of fleas per rat was only 1.2. This figure is somewhat lower than that recorded for other outbreaks. In this connection it is interesting to note that it is rare for a resident of Tacoma to be bitten by a flea. Even the trappers who worked constantly in areas where many infected fleas were present were almost never bitten. Several who worked throughout the campaign were never bitten.

Although the exact origin of the plague cannot be determined, a possible local source is indicated by the fact that the first plague specimens were taken from a heavily rat-infested area where railway cars filled with grain were unloaded. Many of these grain shipments originated in sections of eastern Washington which are known to have rural foci of plague. Evidence of rats and mice was found in several of these grain cars.

Only a few hundred yards from this section were piers at which ships from Hawaiian, Russian, and South American ports docked to load flour and other grain products. A considerable percentage of the vessels engaging in this trade were rat infested, and it is possible that plague could have been introduced in this way.

PROGRAM FOR ERADICATION

As soon as the presence of plague was definitely established, the Public Health Service Office of Plague Suppressive Measures immediately assumed the initiative. Under the Pan-American Sanitary Treaty, the United States Public Health Service has certain obligations when plague is present in a seaport city. Conferences were held and the situation discussed with the Governor of the State of Washington, the Public Health Service quarantine officer for the Northwest District, the State Health Officer, the Fish and Wildlife Service, the

Mayor of Tacoma, the City Commissioners, and the Director of Health for the city of Tacoma.

As the State Health Officer and the Mayor lacked personnel experienced in anti-plague measures, they requested the United States Public Health Service to take immediate charge of the situation. The joint responsibility of the Federal, State, and municipal governments was recognized, however, and each made arrangements to contribute financially to the project. Because of the urgency of the situation, funds were made available at once.

Local newspapers were fully informed but were requested to release no information until an official statement could be issued at an appropriate time after the program was under way.

PRELIMINARY SURVEY

The first objective of the program was a thorough survey of the city by trapping and sanitary inspection. A hasty reconnaissance was made in order to determine the approximate areas of infection. The city was divided into three large districts, lettered A, B, and C. Each of these districts was then subdivided into numbered sections according to type of buildings and activities (fig. 1), and for convenience in the assignment of trappers.

A commissioned officer and nine other employees of the United States Public Health Service experienced in rodent control were detailed to Tacoma to supervise field operations, to do the laboratory work, and to train trappers. The three cooperating agencies joined in providing office space and transportation. Traps and other supplies were procured and on November 4, 1942, trapping operations were started.

It was feared that if trapping began abruptly in the heavy concentration of rats in the focus, the rats might be dispersed and might spread infection before they could be killed. Consequently, trapping was started in the sections which surrounded the area where plague had been found. Gradually the trappers moved concentrically from the outlying territory into the focus itself. This plan of operations provided a zone of traps surrounding the focus which may have served as a barrier against a spread of the infection by destroying rats which tried to migrate.

Additional sections were trapped as more trappers were employed and trained. After an adequate section sample was secured, activities moved to another section unless plague or a heavy rat population was present. If either of these situations prevailed, trapping was continued until no more specimens of plague were found, or until the infestation had been reduced to a point where it was no longer economical to continue. All parts of the city were covered as rapidly as the supply of trappers permitted.

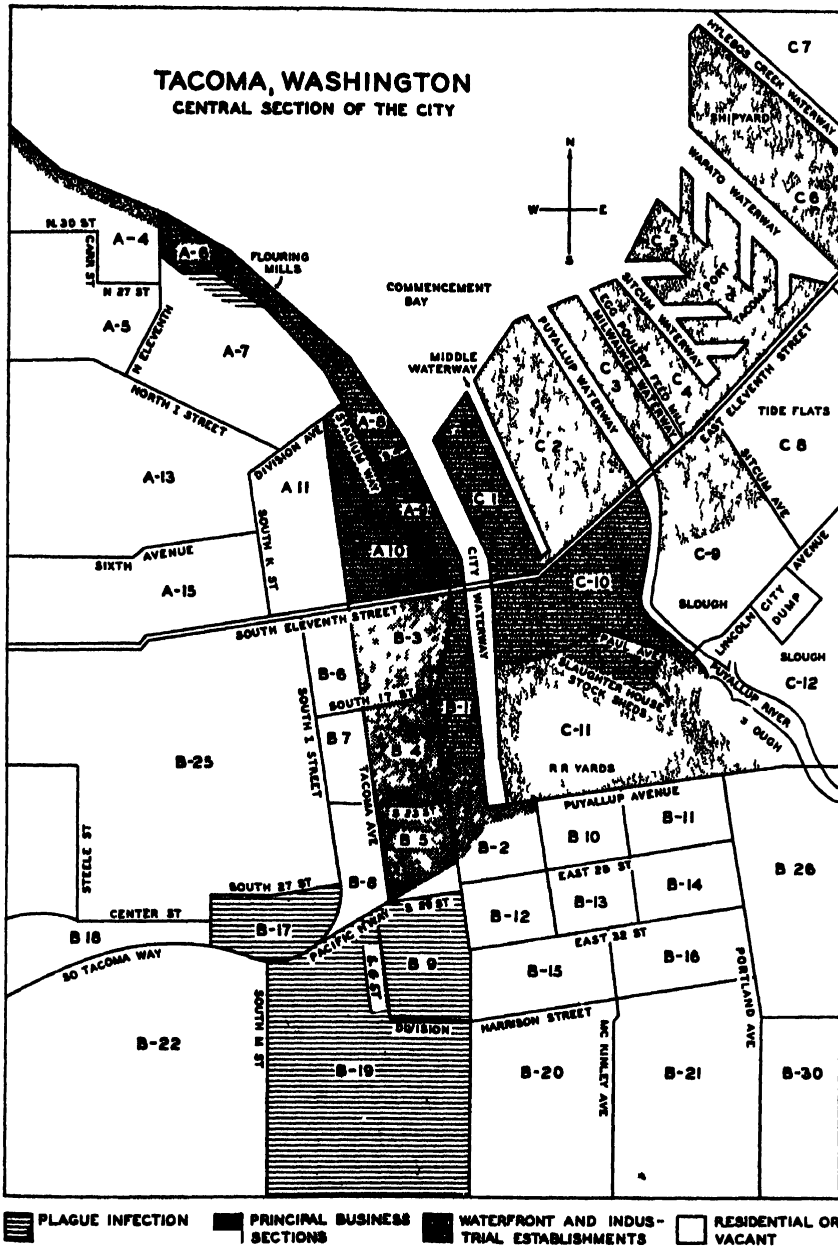

FIGURE 1.—Diagrammatic map of plague infected areas in relation to business and industrial sections

Laboratory activities.—As there was no laboratory adaptable to plague work in Tacoma, it was necessary to build one. Bids were submitted, contracts awarded, and within 1 week the laboratory was in operation.

All of the rodents caught were tagged with identifying data which stated their location and the date on which they were trapped. They were then removed from the traps, placed in fleaproof cloth bags, and delivered to the laboratory at the end of the day's work. At the laboratory the bags containing the rats were placed in a garbage can

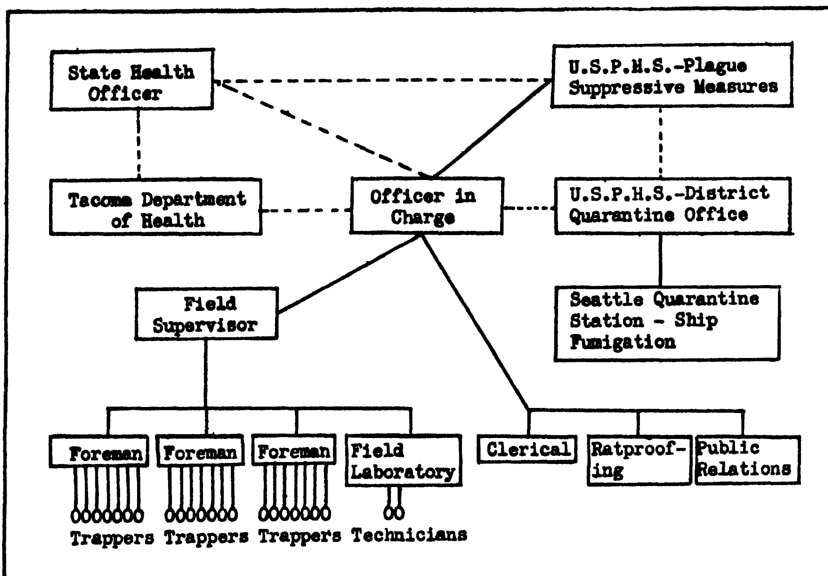

FIGURE 2.—An outline of the administrative plan during the early phases of Tacoma antiplague operations.

covered with a tight-fitting lid and treated with hydrocyanic gas to kill the ectoparasites.

Fleas, lice, and other ectoparasites were removed by striking and combing the animals. The ectoparasites were then placed in vials containing 2 percent salt solution. A separate vial was used for each type of parasite and each trapping section. All rodents were identified, and it was found that *Rattus norvegicus* was the predominant species.

The number of fleas found on the rats varied greatly but averaged only 1.2 per rat. Many rats, especially those living outdoors in such places as the riprap waterfront and the garbage dumps, had very few fleas, but occasionally one was found with as many as 250 fleas.

Representative samples of the fleas were examined morphologically to determine the prevailing species. More than 95 percent were *Nosopsyllus fasciatus*. A few of the common cat and dog fleas and

small rural rodent fleas were identified. Of the many hundreds examined, only nine specimens of *Xenopsylla cheopis* were found, and these originated in an area in which plague was not present.

TABLE 1.—*Distribution of rodents by species, Nov. 4, 1942, to Oct. 31, 1943*

Species	Number of rodents collected	Percentage of total
Rattus norvegicus	19 693	72 0
Rattus rattus rattus	2,969	10 9
Rattus rattus alexandrinus	1,245	4 6
Mus musculus	3,398	12 5
Miscellaneous	16	--
Total	27,321	100 00

After the ectoparasites had been removed, all rodents, except those so badly decomposed that the pathology was obscured, were dissected and examined for the pathologic lesions of plague. Small pieces of spleen, liver, and lymph nodes for those animals with suggestive findings were placed in stoppered bottles and packed in ice and sawdust in thermos jugs. Pools of tissue were taken periodically from rats which appeared to be normal and treated in the same manner.

All flea and tissue specimens were shipped to the laboratory of the United States Public Health Service Office of Plague Suppressive Measures in San Francisco, Calif. At this laboratory the specimens were triturated and inoculated into guinea pigs or mice. Animals inoculated with plague-infected materials usually died in 4 to 7 days. If they were not dead after 10 days these test animals were killed. An autopsy was performed on each animal. The tissues from those showing pathology suggestive of plague were subjected to bacteriologic tests until the organisms were identified.

Pathologic findings.—More than 95 percent of the rats examined in the laboratory were obtained by trapping. As an acutely ill rat is likely to remain in his protected nest, it was not often that specimens were found which showed the advanced pathology of rat plague. Usually the condition was that of a very early infection. Occasionally lesions were seen which suggested resolving or chronic disease.

Usually the subcutaneous tissue was a reddish color faintly tinged with purple which was due to a diffuse engorgement of the vascular bed. The lymphatic glands, usually the axillary or cervical, were slightly enlarged, firm, injected, and sometimes showed slight surrounding edema. The spleen was almost always enlarged, firm, and dark red in color. Occasionally it showed irregularly scattered, grayish-white pinpoint lesions. The liver usually showed grayish-white pinpoint lesions scattered sparsely throughout its substance. Only rarely did the lungs show lesions. Sticky, clear, or serosanguinous pleural fluid was often present in abnormal amounts.

Of the various pathologic lesions observed, an injected subcutaneous tissue and an enlarged, dark, firm spleen were the most consistent indicators of plague infection. In the resolving or chronic cases, however, the only clear-cut pathology in many specimens was a scarred or adherent spleen.

Infected specimens—From the 26,048 rodents examined by dissection, 592 pools of tissue were sent to the San Francisco laboratory. Of these, 262 were from apparently normal animals, and plague was identified in 4 of them. The other 330 pools were from animals which showed lesions simulating plague, and 30 were proved to be plague-infected. Of the 1,765 pools of fleas examined, averaging 17 per pool, 54 were positive.

Undoubtedly, many infected rats were not detected with the method used. The active epizootic persisted from the beginning of the campaign to May 4, 1943, and accurate records were kept during this time so that it was possible to estimate the approximate percentage of infected rats and fleas. It was determined that at least 2.2 of each 1,000 rats were infected, and at least 2.7 of each 1,000 fleas contained plague organisms The rates were considerably higher when only those animals from plague foci were considered.

Species infected.—So far as could be determined, the infection was confined to the Norway rats. Occasionally infected fleas were taken from the "black" and "Alexander" rats, but in not a single instance was tissue from these rats found to be infected.

Distribution of infection—The distribution of the infection followed a definite pattern (fig 1). There were two principal foci of infection, as shown in table 2. One was at the flour mills (A6) and the other at the slaughterhouse and its stock sheds (C11). The infection had spread and was found in all sections between the two foci, but the distance that the infection spread was limited by geographic features. The Puyallup River limited its extension eastward. The high escarpment along the west side of the bay limited its westward extension. Each of these geographic barriers prevented a large-scale migration of rats and consequent spread of the infection.

TABLE 2—*Number of times plague was found in the various sections of the city*

District	Type of activity	Plague isolations	
		Tissue	Fleas
A6	Flour mills, water front	10	22
A7	Upper class residential	1	1
A8	Water front, docks, warehouses	0	3
A9	Water front, docks, warehouses	6	4
A10	Commercial, residential	2	1
B1	Industrial, water front	1	1
B9	Old residential	0	1
B17, 19	Old residential, light industrial	0	1
C1	Water front	0	1
C10	Industrial	2	1
C11	Industrial, meat packing	12	18

In two areas, however, the effectiveness of the escarpment as a barrier was nullified. The business section is located on the edge of the escarpment, and a few roads lead through it into the central business district. This accounts for the three positive specimens taken in A10. The two positive specimens found in A7 were taken from the group of houses at the top of the escarpment above the flour mills, where the rat burrowing and colonization were fostered by spillage of grain along a spur unloading track. In addition, the slope of the escarpment at this point is gradual enough to permit rat burrowing and foraging.

At the southern end of the business section the escarpment is cut by two wide, deep gulches which could serve as a natural channel of rat migration from the heavily infested and infected section C11. That they did so serve is indicated by the presence of one positive specimen along each of these gulches (B9 and B17–19).

In the tideflat section, the disease was not found south of the slaughterhouse in C11. No distinct geographic barrier interfered with migration, but the sloughs and railroad yards south of this plant are not favorable to rat harborage and contained no appreciable supply of food.

It was fortunate that the infection was so definitely confined because this made possible a concentration of measures that quickly controlled the infection.

Surveys in adjacent areas.—Because of the proximity and close connection, by rail and ship, of other cities to Tacoma, it seemed advisable to make limited surveys in these areas to determine whether plague had spread to them. Surveys were made in all the major Puget Sound ports by units of the United States Public Health Service operating independently of the Tacoma project. No plague infection was found. Through the cooperation of the Post Surgeon a survey was made at Fort Lewis by Army personnel trained by the Tacoma plague-control group. No plague was detected in the 830 rodents examined.

CONTROL MEASURES

By March 1943 the extent and distribution of the rat infestation was determined and the area infected was known. Control work already had begun in many of the areas, but after April 1 the emphasis swung entirely from survey to control. Trapping was continued in and around all positive areas for four purposes: To eradicate infected rats; to prevent migration to uninfected areas; to provide a steady flow of rats for laboratory examination in order to determine the course of the epizootic, and to gage the progress being made in reducing the total rat population. The administrative plan for control work was closely coordinated between the agencies (fig. 3).

The method of control was adapted to the individual situation. The usual methods were trapping, poisoning, and gassing, and these were supplemented as occasion demanded by shooting, clubbing, and destruction of nests. Food sanitation and destruction of harborage were carried out on all infested premises. The graphs in figure 4 illustrate the trend of the trapping catch in proportion to the number of trapping days and the application of the accessory control measures.

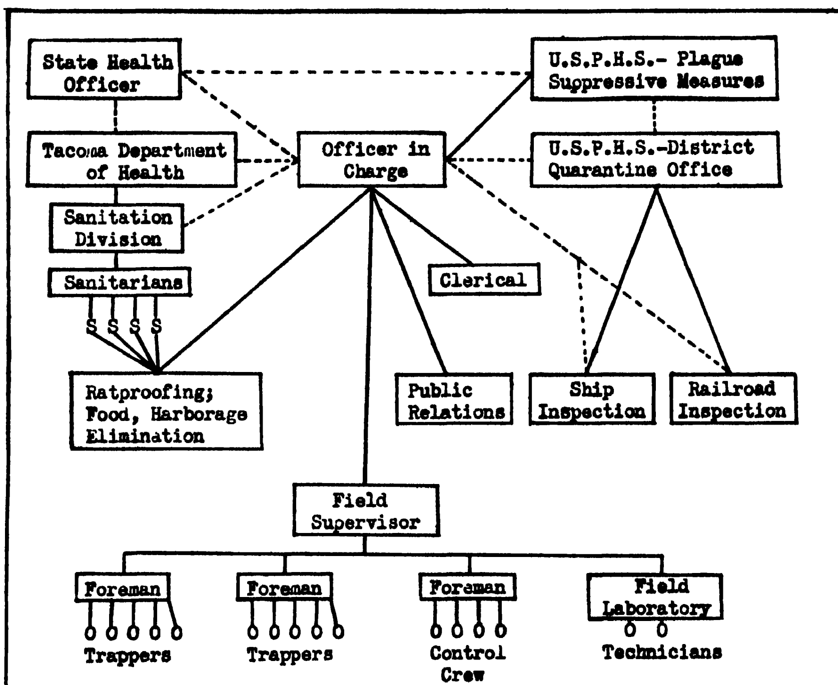

FIGURE 3.—Administrative plan for control work, Tacoma antiplague operations

Trapping.—The majority of the men employed devoted most of their time to trapping activities. Each trapper tended daily from 200 to 500 traps, depending on the size of the area and the density of the rat population. Ordinary wooden snap traps of conventional design were used exclusively, baited with one-half inch cubes of bacon.

A total of 948,102 trap days, most of them in the industrial water front and business sections, resulted in a catch of 25,618, rodents of which 22,238 were rats, an index of 2.3 rats per 100 trap days.

Poisoning.—Zinc phosphide, thallium sulfate, and phosphorus paste on bread, meat, fish, apple, and vegetables were the poisons used for bait. Those giving the best results were phosphorus on bread or canned salmon and thallium sulfate on oat groats, fresh meat, or fish (table 3).

TABLE 3.—*Poisoning operations*

Poison	Number of baits	Man hours	Rats recovered
Zinc phosphide	63,000	92	3
Thallium sulfate	30,149	216	424
Phosphorus	162,680	292	188
Total	255,829	600	615

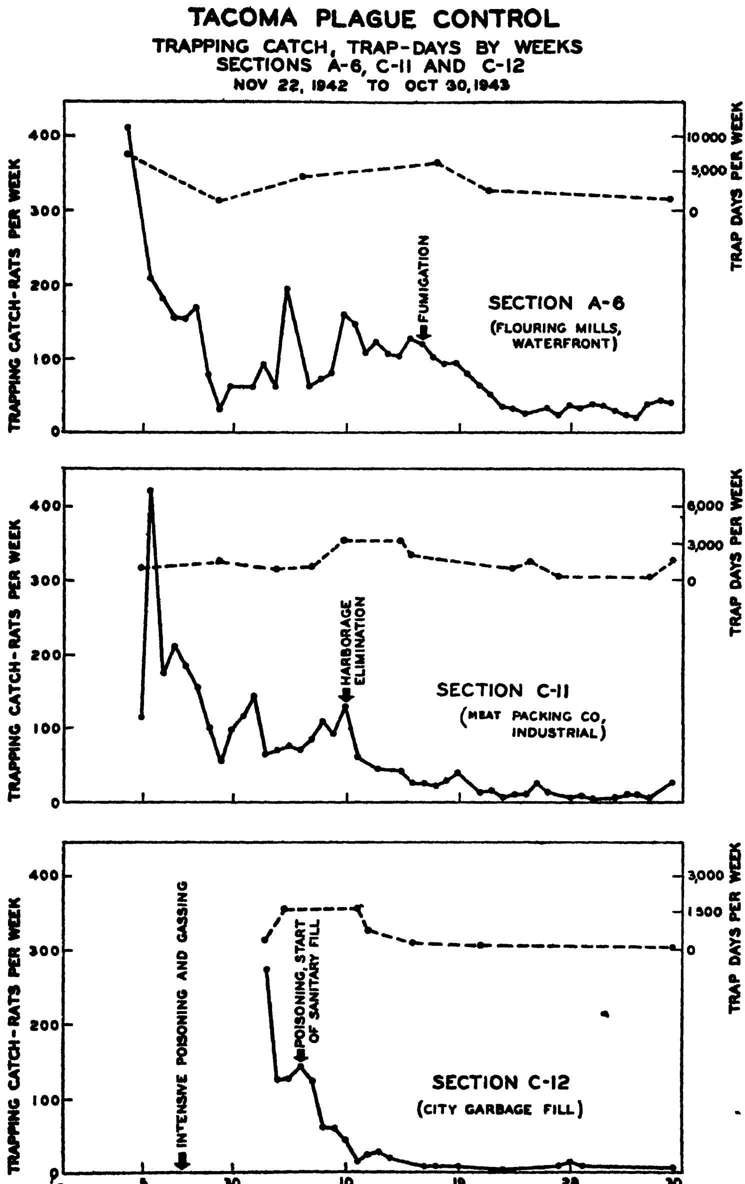

FIGURE 4.—Graphs showing reduction in total rat population (as indicated by trapping catch) and the relationship to various control measures.

Altogether, 255,829 poisoned baits were distributed, from which 615 rats were recovered. No accurate estimate of the total number of rats killed by poison can be given because rats usually die in their holes where it is impossible to recover them. Undoubtedly many times the number recovered were killed by the poison.

Trapping and poisoning were sufficient to control the infestation in several sections, but in the more heavily infested areas other methods were necessary.

Gassing.—In places where rats were living in ground burrows or in narrow enclosed spaces, gassing with calcium cyanide dust was effective. Its value was limited, however, in areas where the rats were harboring in long deep burrows or in complicated spaces such as the riprap water front.

Fumigation.—Fumigation was effective in eliminating rats in the interior of the large flour mills after the buildings had been made more resistant to rat traffic to and from the outside. All buildings were fumigated by commercial fumigators under government supervision from one to three times during the period of operations. The areas fumigated had a capacity of about 7,000,000 cubic feet. More than 70,000 ounces of hydrocyanic acid gas, principally in liquid form, were used. Fiber discs, impregnated with hydrocyanic acid gas, and generated gas were employed in a few places. The minimum exposure was 4 ounces per 1,000 cubic feet for 24 hours, and 440 rats were recovered.

Several parts of the flour mills were piped for liquid gas, and fumigation had been regularly conducted twice a year. As the fumigations were done primarily for the control of insects, the piping did not extend into many of the areas most heavily rat infested. The piping has now been extended and new systems installed so that all areas with actual or potential rat infestation will be fumigated two or three times a year.

Food sanitation.—Efforts were made to remove all available food supplies from all areas. Around the flour mills, grain elevators, and stockyards the control of food supply was especially difficult, but in most areas the supply of food accessible to rats was greatly reduced.

The proper handling of garbage was handicapped by a lack of suitable garbage cans. This was due to wartime restrictions on metal products. After considerable effort, priority to purchase several thousand metal cans was obtained. These cans were distributed in places where they were most needed, and alleviated the situation considerably. The many small "unofficial" garbage dumps in various sections were cleaned up, and warnings against further dumping were posted.

At the beginning of the program, all garbage and refuse collected under supervision of the municipal government were deposited on an open dump located on the tideflats near the industrial area (C12). This fill, which occupied about 10 acres, was utilized for open dumping of garbage and the burning of combustible refuse without any orderly system of procedure. It had a heavy and extensive infestation of rats.

Before any change in the disposal procedures was made, intensive suppressive measures were started at this dump. Sustained trapping, large-scale poisoning, gassing of burrows, and removal of rat harborage caused a satisfactory reduction in the rodent population within a few weeks. After this had been done, all exposed garbage and refuse were covered with earth and a modified sanitary fill was started to effect a proper disposal of garbage. By this method the active face was limited to a 100-foot width and a 12-foot depth. All exposed surfaces, except the active face, were covered with earth every day. A tractor with bulldozer attachment provided placement and compaction of garbage and cover material. Within 2 months the trapping catch at the garbage fill was reduced from 300 rats per week to fewer than 10. No plague-positive rats were found among the 2,000 examined from this source.

Proper disposal of lunch scraps was a problem in many sections, especially at the shipyards and lumber mills. Receptacles placed in strategic places and posted warnings controlled this situation.

Harborage elimination and ratproofing.—As soon as the emphasis changed from survey to control work, two sanitarians were employed and trained in rodent-control methods which emphasized rat harborage elimination and exterior or "vent stoppage" ratproofing. Two general sanitarians on the regular staff of the health department also were given this special training. In cooperation with the sanitation section of the health department, these men were assigned to districts in which they carried on rodent control in addition to their general sanitation programs. Premises in need of attention were referred to them, and assistance in formulating recommendations was available to them when requested. Attention was concentrated on areas in or near plague foci.

Projects which had already been started, and those which involved a considerable expenditure of money, were handled directly by members of the plague-control staff.

Altogether, 993 premises were inspected for possible ratproofing. Ratproofing has been completed on 135, and work is still in progress on 250 premises. The work done on these premises varied from removal of board floors, piles of lumber, trash, and other harborages which required only a few hours' labor, to extensive projects costing as much as $50,000 (estimated).

As considerable difficulty was experienced in obtaining metal products because of priority restrictions, the work was confined to exterior ratproofing which consumed the least amount of strategic materials. Sufficient quantities of sheet metal and wire cloth were obtained, however, so that lack of materials did not prevent the completion of any project.

The most extensive projects were undertaken at the flouring mills and the slaughterhouse and stock sheds. At the slaughterhouse, 7,600 cubic yards of gravel were used to fill a rat-infested slough at a cost of $4,934.70. The large stock sheds serving this company were heavily infested. Rat harborages were found under concrete platforms, mangers, and feed bins. Extensive destruction of these harborages was carried out, and reconstructive work designed to eliminate them permanently is now nearing completion. The estimated cost of this work was $10,000. A large ratproof room also was constructed for the storage of grain feed at a cost of several hundred dollars.

Reconstructive work at the flour mills was confined to ratproofing the buildings exteriorly and eliminating inside harborages by removing double walls, opening sheathing on beams, etc. The open ground areas under the buildings were ratproofed by the use of concrete and wire cloth. Doors were adjusted and flashed. Defects in the walls were repaired. All rat holes and runways were stopped. Stored lumber was removed. Driftwood under the mills' docks was cleaned up and catch aprons were installed to minimize grain spillage. Several sections of railroad track, where grain was transferred to and from railroad cars, were paved with concrete to facilitate cleaning. The cost of this work is estimated at $10,000.

Along the water front, the railroad spurs and property adjacent to the flour mills are owned by a large railroad company. The dense vegetation of the embankment along the grain-unloading tracks on the "highline" was removed because it afforded excellent rat harborage. In this section, the water front was formed by a large rock-rubble type of riprap which was heavily infested. Instead of constructing a permanent ratproof bulkhead, the railroad company filled the large rubble with finer crushed rock. Although this has eliminated the harborage temporarily, continued maintenance will be necessary. It is estimated that 10,500 or more cubic yards of rock were used to cover the 3,500-foot length of water front at an estimated cost of $50,000.

Two other large docks, one used as a grain storehouse (A9), the other containing an egg and poultry house and a feed mill (C4), have been ratproofed, but much less extensive work was necessary because of the nature of their construction.

Quarantine.—From February to May 1, 1943, two experienced quarantine inspectors were detailed to Tacoma from the United States

Public Health Service Quarantine Station in New York City. One of these was assigned to full-time ship inspection.

Each ship was inspected thoroughly. The number of rats aboard was estimated. A few vessels were required to have fumigations because of excessive rat population. The majority of vessels, however, were satisfactorily controlled by trapping. A total of 90 ships was inspected, of which 33 were found to be infested. On these, 121 rats were trapped while the vessels were in port. All of these rats were examined in the laboratory, but no infection was found.

In addition, each ship was required to have a sufficient number of metal garbage cans with tight-fitting covers which were to be used exclusively for food waste. Burlap bags were used for old papers, cans, bottles, and other non-rat-attracting trash. When permitted by the regulations of the Bureau of Animal Industry, United States Department of Agriculture, garbage was removed from the ship and transported to the city garbage dump. Dumping of garbage overboard while in port was prohibited. Approved rat guards were required to be properly placed on all lines at all times. General cleaning of rat-infested compartments and ratproofing of some were requested.

The other inspector was assigned to inspection of railroad cars and their loading and unloading areas in order to prevent the transportation of rats from Tacoma by rail. A survey of 300 cars used in grain shipment revealed that 2 percent showed signs of recent rodent infestation. This inspector also directed rodent-eradication measures in the vicinity of the loading and unloading areas as a further precaution against the possible spread of plague-infected rats.

All rail and maritime inspections were discontinued on May 31, 1943, because the infection was well under control. After June 1, 1943, a cooperative arrangement was made so that the dock operators and the health department jointly enforced rat guarding and other requirements.

Educational activities.—An educational pamphlet giving simple directions for rodent-eradication measures was prepared by the Tacoma Health Department and distributed as opportunity permitted. Newspapers cooperated by releasing appropriate publicity. A few talks on the rat were given upon request. In addition, 279 rat complaints were answered and advice was given on control measures. The rat film "Keep 'Em Out" was shown to several interested groups and several radio broadcasts were made.

Many members of health departments in areas near Tacoma became interested in anti-plague measures as a result of the outbreak and visited the project to study rat-control methods. Each was instructed as thoroughly as his time allowed. One bacteriologist from the Canadian Ministry of Health also visited the project and was given some training.

OPERATING COSTS

In comparison with the costs of plague eradication programs in other outbreaks, the cost of the Tacoma project has not been great. For example, the San Francisco outbreak required $561,143.65 for a period of 11 months in 1907–08, when trappers could be hired for only $2 to $2.50 per day. During the same period, the city of Oakland spent about $65,000 on plague eradication measures.

During the fiscal year 1914–15, the campaign in New Orleans required $526,704.27. It cost the city of Seattle $65,000 to eradicate plague. In view of these facts, the city of Tacoma was fortunate in having plague controlled at such a nominal cost. In addition, approximately $5,000 of this investment remains in capital equipment over and above that expended in training personnel, and can be used to carry on a permanent program.

Approximate summary of amounts contributed by the agencies concerned, Nov. 1, 1942, to Oct. 31, 1943[1]

U. S. Public Health Service	$24, 122. 80
State of Washington	12, 682. 66
City of Tacoma	19, 936. 89
Total	56, 742. 35

[1] This figure includes no allowance for depreciation of vehicles or capital equipment

Of the $56,742.35, $5,268.47 was expended for capital equipment, supplies, and operating expenses. The remainder was spent for salaries.

The labor turn-over during the early part of the program was too rapid to permit an estimate of the average number of employees. As a rule, however, the number of employees engaged directly in the campaign averaged 25 to 27 during November 1942 to April 1943. After that time the number was gradually reduced. During September and October, the average number of employees was 15. Trappers were paid $200 a month and the supervisory and special personnel somewhat more. The high wage scale was necessary because of the prevailing wages in nearby war industries. All employees worked six 8-hour days per week.

RESULTS OF THE PROGRAM

Early in the campaign the concentrated application of control measures began to be reflected in the trapping catch. In some areas that had been producing 100 or more rats per week, the catch became so small that trapping was discontinued. On May 4, 1943, the last positive specimen was found. Since then, more than 8,000 rodents and their ectoparasites have been examined without detecting the

presence of plague. It therefore seems reasonable to conclude that the infection has been brought under complete control and that plague has been eradicated in Tacoma.

No claim is made that all rats in the city have been destroyed. The work necessarily was confined to the areas in which plague infection was found. But the total rat population has been reduced and all major concentrations of rats have been eliminated.

It is believed that officials and citizens of Tacoma are now more aware of the seriousness of rat infestation. The program may have stimulated them to devote more attention to it in the future. A group of men have been trained in rodent control methods and are available to the city. They should provide a sound foundation upon which to build a permanent rodent control program adequate to prevent further outbreaks of plague.

DEATHS DURING WEEK ENDED SEPTEMBER 9, 1944

From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept 9, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	7,673	7,623
Average for 3 prior year	7,511	
Total deaths, first 36 weeks of year	327,682	334,120
Deaths under 1 year of age	628	613
Average for 3 prior years	572	
Deaths under 1 year of age, first 36 weeks of year	22,31	24,098
Data from industrial insurance companies.		
Policies in force	66,723,057	65,808,740
Number of death claims	9,601	7,980
Death claims per 1,000 policies in force, annual rate	7 5	6.3
Death claims per 1,000 policies, first 36 weeks of year, annual rate	10 1	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 16, 1944

Summary

The incidence of poliomyelitis for the country as a whole declined for the second consecutive week, but decreases in the New England, Middle Atlantic, West North Central, and South Atlantic areas were partly offset by increases, chiefly in Ohio, Michigan, Wisconsin, Maryland, Kentucky, and California. A total of 1,440 cases was reported, as compared with 1,498 for the preceding week, 1,020 for the corresponding week last year, and a 5-year (1939–43) median of 593. The largest weekly total so far reported was 1,682 for the week ended September 2, which is also the largest total for any week since weekly records became available (1927). The current figure is above that recorded for any week in prior years, the next largest being 1,370, reported for the week ended September 5, 1931.

Fifteen States reporting currently more than 16 cases each (last week's figures in parentheses) are as follows: *Increases*—New Jersey 54 (50), Ohio 118 (92), Indiana 24 (23), Michigan 112 (75), Wisconsin 31 (20), Maryland 54 (32), North Carolina 28 (26), Kentucky 40 (33), California 25 (12); *decreases*– Massachusetts 28 (42), New York 497 (581), Pennsylvania 123 (130), Illinois 44 (45), Minnesota 40 (48), Virginia 46 (67).

The cumulative total to date this year is 12,413 (as compared with 7,812 for the same period last year and 5-year median of 4,856), probably exceeded only twice by the total for any entire year since 1916 (12,439 in 1943, and 15,745 in 1931).

The cumulative total of meningococcus meningitis to date is 13,607, as compared with 14,153 for the same period last year and a 5-year median of 1,544. The total for the entire year 1943 was 17,922.

The current total for scarlet fever is above that for last week, but below both the 5-year median and the total for the corresponding week last year. The cumulative total is 150,581, as compared with 101,240 for the same period last year, which figure is also the 5-year median.

An aggregate of 7,793 deaths was recorded for the week in 92 large cities of the United States, as compared with 7,655 last week and 3-year (1941–43) average of 7,729. The cumulative total is 334,568, as compared with 341,169 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Sept. 16, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median	Week ended—		Median	Week ended—		Median	Week ended—		Median
	Sept. 16, 1944	Sept. 18, 1943	1939–43	Sept. 16, 1944	Sept. 18, 1943	1939–43	Sept. 16, 1944	Sept. 18, 1943	1939–43	Sept. 16, 1944	Sept. 18, 1944	1939–43
NEW ENGLAND												
Maine	0	0	0	---	---	---	0	5	7	0	3	1
New Hampshire	0	0	0	---		---	2	0	0	0	0	0
Vermont	0	1	0			---	0	1	2	1	0	0
Massachusetts	6	2	2	---		---	18	31	31	3	10	1
Rhode Island	0	0	0	---			0	17	9	2	3	0
Connecticut	0	1	0	---	5	1	5	9	5	3	8	0
MIDDLE ATLANTIC												
New York	15	7	7	(1)	(1)	[1] 3	21	70	70	13	12	8
New Jersey	2	1	1	---	4	4	8	86	21	3	5	1
Pennsylvania	8	4	7	---	---	---	26	12	26	11	10	3
EAST NORTH CENTRAL												
Ohio	11	5	5	2	1	7	5	40	17	6	5	1
Indiana	5	3	3	7	4	4	4	10	3	3	1	0
Illinois	3	8	14	1	6	4	14	15	20	9	8	1
Michigan [2]	9	4	3	1	2	2	9	151	44	9	9	1
Wisconsin	0	0	0	10	17	17	30	75	61	4	0	0
WEST NORTH CENTRAL												
Minnesota	5	8	1	---	---	---	4	17	5	1	0	0
Iowa	0	7	3	---	1	1	2	0	7	0	5	0
Missouri	3	1	3	2	---	---	3	1	2	4	2	0
North Dakota	1	2	1	3	---	---	0	14	0	0	0	0
South Dakota	6	2	2	---	---	---	2	0	1	0	0	0
Nebraska	2	6	1	2	---	---	1	1	2	0	0	0
Kansas	2	3	4	---	---	1	7	4	5	1	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	---	---	---	0	1	1	---	0	0
Maryland [2]	1	0	1	---	---	1	3	6	5	0	1	1
District of Columbia	0	0	1	---	---		0	1	1	0	1	0
Virginia	4	7	8	55	74	66	4	19	10	4	4	1
West Virginia	8	6	6	---	1	3	2	5	5	1	4	2
North Carolina	13	47	40	---	---	---	5	9	7	1	2	1
South Carolina	9	19	19	129	122	123	6	6	6	3	1	0
Georgia	13	32	24	3	36	13	4	1	1	1	0	0
Florida	4	3	3	1	5	2	5	3	3	1	2	0
EAST SOUTH CENTRAL												
Kentucky	8	8	8	1	1	---	0	3	10	0	2	0
Tennessee	6	17	14	5	6	9	2	13	10	2	6	1
Alabama	34	16	19	8	17	8	1	2	2	1	6	1
Mississippi [2]	14	12	12	---	---	---	---	---	---	0	1	0
WEST SOUTH CENTRAL												
Arkansas	4	5	12	24	5	5	3	11	10	1	1	0
Louisiana	6	7	7	2	7	2	0	1	1	0	2	0
Oklahoma	9	3	8	---	1	10	1	3	2	0	1	1
Texas	43	26	26	259	284	156	18	28	28	2	2	1
MOUNTAIN												
Montana	8	4	0	2		---	2	12	3	1	0	0
Idaho	0	0	0	5	1	---	0	0	1	0	0	0
Wyoming	0	0	0	---		---	1	1	1	0	0	0
Colorado	4	3	3	6	4	5	1	4	4	2	0	0
New Mexico	2	1	1	3	1	1	1	0	1	0	0	0
Arizona	1	1	0	24	34	34	0	3	3	2	2	1
Utah [2]	0	0	0	---	---	---	8	6	6	0	0	0
Nevada	1	0	0	---	---		23	13	0	0	1	0
PACIFIC												
Washington	8	3	3	---	---	---	15	13	13	4	2	1
Oregon	2	1	1	1	4	6	11	15	15	3	3	0
California	21	16	15	8	14	14	88	42	42	24	9	1
Total	301	302	310	564	657	601	365	780	561	126	135	30
37 weeks	7,729	8,312	8,744	340,887	84,051	153,176	593,079	540,807	468,877	13,607	14,153	1,544

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended Sept 16, 1944 and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Sept 16 1944	Sept 18 1943		Sept 16 1944	Sept 18 1943		Sept 16 1944	Sept 18 1943		Sept 16 1944	Sept 18 1943	
NEW ENGLAND												
Maine	1	2	1	13	8	6	0	0	0	0	0	3
New Hampshire	6	0	0	1	1	1	0	0	0	0	1	0
Vermont	2	2	2	4	2	3	0	0	0	0	0	1
Massachusetts	28	35	6	57	79	59	0	0	0	6	8	5
Rhode Island	0	20	1	0	6	2	0	0	0	1	1	0
Connecticut	12	32	6	5	16	11	0	0	0	3	0	1
MIDDLE ATLANTIC												
New York	40[illegible]	65	6[illegible]	81	79	72	0	0	0	7	9	16
New Jersey	54	8	20	16	21	21	0	0	0	3	4	5
Pennsylvania	123	18	18	[illegible]7	57	57	0	0	0	9	6	20
EAST NORTH CENTRAL												
Ohio	118	20	20	50	64	64	1	0	0	7	7	8
Indiana	24	13	7	23	21	21	0	0	1	3	0	2
Illinois	44	208	52	49	55	52	0	0	0	0	9	10
Michigan [2]	112	29	29	38	39	4[illegible]	0	0	0	3	4	4
Wisconsin	31	18	6	29	36	43	0	0	1	1	1	1
WEST NORTH CENTRAL												
Minnesota	40	10	10	22	25	16	0	0	0	0	0	1
Iowa	13	29	12	10	16	16	0	0	0	0	1	1
Missouri	4	13	3	19	27	18	0	0	0	5	4	6
North Dakota	[illegible]	2	1	5	15	4	0	0	0	0	0	0
South Dakota	1	4	2	0	4	7	0	0	0	1	0	0
Nebraska	4	13	11	6	9	8	0	0	0	0	0	0
Kansas	9	77	10	18	34	32	0	0	0	6	4	3
SOUTH ATLANTIC												
Delaware	6	0	0	0	0	4	0	0	0	0	0	0
Maryland [2]	[illegible]4	2	1	16	15	15	0	0	0	5	4	4
District of Columbia	16	2	1	3	4	4	0	0	0	0	1	1
Virginia	46	6	6	24	27	20	1	0	0	3	8	14
West Virginia	10	1	1	48	74	28	0	0	0	6	1	8
North Carolina	28	1	3	34	69	46	0	0	0	3	7	7
South Carolina	0	1	3	4	8	9	0	0	0	6	3	11
Georgia	[illegible]	4	4	15	24	21	0	0	0	6	8	8
Florida	4	6	4	4	7	4	0	0	0	1	1	4
EAST SOUTH CENTRAL												
Kentucky	40	5	9	18	24	25	0	0	0	6	9	14
Tennessee	11	0	3	34	28	28	1	0	0	9	10	12
Alabama	[illegible]	0	1	23	25	19	0	0	0	4	2	7
Mississippi [2]	3	2	3	11	8	8	0	0	0	8	5	5
WEST SOUTH CENTRAL												
Arkansas	1	2	2	6	4	4	0	0	1	11	6	14
Louisiana	2	4	1	5	5	2	0	0	0	6	12	13
Oklahoma	2	26	2	3	0	9	0	0	0	2	2	11
Texas	10	[illegible]7	8	10	18	18	0	1	0	13	8	36
MOUNTAIN												
Montana	3	4	2	9	9	9	0	0	0	0	0	1
Idaho	1	1	1	1	11	3	0	0	0	0	0	0
Wyoming	0	1	0	2	3	1	0	0	0	0	0	0
Colorado	7	35	6	12	18	14	0	0	0	1	1	4
New Mexico	2	8	2	3	2	2	0	0	0	2	3	3
Arizona	2	2	0	3	1	1	0	0	0	0	3	3
Utah [2]	2	41	4	6	10	8	0	0	0	0	0	0
Nevada	1	0	0	0	2	0	0	0	0	0	0	0
PACIFIC												
Washington	14	27	8	13	21	12	0	0	0	2	1	1
Oregon	12	14	4	15	11	8	0	0	0	0	0	2
California	25	150	14	68	77	55	0	0	0	13	5	8
Total	1 410	1 020	593	893	1 119	949	3	1	10	162	159	342
37 weeks	12 413	7 812	4 856	150 581	101 240	101 240	314	619	1 204	3 924	4 008	5 878

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts, 5, New York, 2 Maryland, 1 South Carolina, 5, Georgia, 2, Florida, 1, Louisiana 1, Washington, 1, California, 8

Telegraphic morbidity reports from State health officers for the week ended Sept 16, 1944, and comparison with corresponding week of 1943 and 5-year median Con

Division and State	Whooping cough, Week ended— Sept 16 1944	Whooping cough, Week ended— Sept 18, 1943	Whooping cough, Median 1939–43	Week ended September 16, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	16	24	27	0	0	0	0	0	0	0	0	1
New Hampshire	3	2	0	0	0	0	0	0	0	0	0	0
Vermont	23	15	15	0	0	0	0	0	0	0	0	0
Massachusetts	86	95	134	0	0	12	0	0	0	0	0	0
Rhode Island	8	153	31	0	0	0	0	0	0	0	0	0
Connecticut	36	21	41	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	168	204	319	0	3	53	0	0	0	0	0	0
New Jersey	70	150	150	0	1	1	0	1	0	0	0	0
Pennsylvania	99	196	241	0	1	1	0	1	0	0	0	1
EAST NORTH CENTRAL												
Ohio	122	147	162	0	1	0	0	0	0	0	1	0
Indiana	10	25	31	0	1	0	0	0	0	0	0	0
Illinois	104	139	237	0	0	2	0	0	0	2	0	0
Michigan [3]	114	188	256	0	2	9	0	0	0	0	0	0
Wisconsin	126	249	204	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	37	60	57	0	6	0	0	2	0	0	0	0
Iowa	7	11	11	0	0	0	0	0	0	0	0	0
Missouri	10	18	19	0	0	0	0	0	0	0	0	0
North Dakota	10	7	5	0	1	0	0	1	0	0	0	0
South Dakota	13	11	9	0	0	0	0	0	0	0	0	0
Nebraska	1	6	6	0	0	0	0	0	0	0	0	0
Kansas	23	21	35	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	3	0	2	0	0	0	0	0	0	0	0	0
Maryland [3]	66	81	46	0	0	0	10	0	0	2	0	0
District of Columbia	2	14	23	0	0	0	0	0	0	0	0	0
Virginia	22	63	47	0	0	0	244	0	0	0	1	0
West Virginia	18	50	31	1	0	0	0	0	0	0	0	0
North Carolina	73	77	79	0	0	0	0	0	0		0	1
South Carolina	65	95	26	0	0	26	0	0	0	0	0	19
Georgia	17	10	9	0	1	4	0	0	0	0	2	30
Florida	2	12	8	0	1	0	0	0	0	0	0	10
EAST SOUTH CENTRAL												
Kentucky	40	63	63	0	0	0	0	0	0	0	0	0
Tennessee	36	47	33	0	0	0	12	0	0	1	0	3
Alabama	22	2	15	0	1	0	0	0	0	0	0	46
Mississippi [3]				0	0	0	0	0	0	0	0	6
WEST SOUTH CENTRAL												
Arkansas	28	13	13	0	0	16	0	0	0	0	6	0
Louisiana	2	2	2	0	1	5	0	0	0	0	1	18
Oklahoma	1	6	8	0	0	0	7	1	0	0	0	0
Texas	86	107	96	0	10	323	4	1	0	0	0	40
MOUNTAIN												
Montana	38	22	22	0	0	0	0	1	0	0	0	0
Idaho	1	5	4	0	0	0	0	0	0	0	0	0
Wyoming	5	13	13	0	1	0	0	0	0	1	0	0
Colorado	62	9	15	0	0	1	0	3	0	0	0	0
New Mexico	4	2	14	0	0	7	7	0	0	0	0	0
Arizona	10	19	14	0	2	0	9	0	0	0	0	0
Utah [3]	4	54	33	0	0	0	0	0	0	0	0	0
Nevada	1	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	36	66	53	0	0	0	2	1	0	0	0	0
Oregon	13	19	16	0	0	0	0	0	0	0	0	0
California	106	179	187	0	0	14	0	2	1	0	0	4
Total	1 849	2 772	2 799	1	36	474	295	13	1	9	11	179
Same week 1943	2 772			0	41	401	214	22	0	15	11	168
Same week 1942	3 003			2	31	259	179	25	0	16	9	133
37 weeks 1944	70 150			32	1 245	16 095	6 315	472	21	416	419	3 441
37 weeks 1943	142 692			47	1 536	11 979	5 834	525	19	404	640	2 796
37 weeks 1942	133 994		[4] 137,038	63	818	6 572	5 087	402	35	[4] 421	700	[4] 1 928

[3] Period ended earlier than Saturday [4] 5-year median 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended September 2, 1944

This table lists the reports from 89 cities of more than 10 000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis infectious cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	1	1	1	0	0	1
New Hampshire												
Concord	0	0		0	0	0	4	1	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	0	0		0	10	0	5	5	11	0	0	19
Fall River	0	0		0	0	0	0	1	0	0	0	1
Springfield	0	0		0	0	0	0	2	1	0	0	4
Worcester	0	0		0	0	0	5	0	0	0	0	1
Rhode Island												
Providence	1	0		0	1	1	2	0	1	0	0	6
Connecticut												
Bridgeport	0	0		0	0	0	2	4	0	0	0	0
Hartford	1	0		0	0	1	0	1	2	0	0	2
New Haven	0	0		0	0	1	1	0	0	0	0	14
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	0	1	78	1	0	2	0
New York	[illegible]	[illegible]	1	0	5	11	33	253	33	0	11	[illegible]
Rochester	0	0		0	4	1	0	[illegible]	0	0	0	10
Syracuse	0	0		0	0	0	3	6	2	0	0	7
New Jersey												
Camden	0	0		0	0	0	0	[illegible]	1	0	0	0
Newark	0	0		0	1	0	4	16	2	0	0	6
Trenton	0	0	1	0	0	0	0	0	0	0	0	4
Pennsylvania												
Philadelphia	1	0		0	5	4	[illegible]	[illegible]	12	0	1	12
Pittsburgh	1	0	1	1	0	0	[illegible]	13	[illegible]	0	0	4
Reading	0	0		0	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		0	0	2	2	11	[illegible]	0	0	7
Cleveland	0	0	3	0	0	1	4	27	9	0	2	20
Columbus	0	0	1	1	0	0	1	1	2	0	0	2
Indiana												
Fort Wayne	0	0		0	0	0	2	1	1	0	0	0
Indianapolis	[illegible]	0		0	0	0	0	1	3	0	0	10
South Bend	0	0		0	0	0	0	0	1	0	0	0
Terre Haute	0	0		0	0	0	1	2	0	0	0	0
Illinois												
Chicago	0	0	1	1	6	4	11	6	3	0	2	37
Springfield	0	0		0	0	0	0	0	0	0	0	2
Michigan												
Detroit	5	0		0	2	5	3	60	9	0	2	[illegible]
Flint	0	0		0	0	0	1	1	0	0	0	0
Grand Rapids	0	0		0	0	0	1	1	2	0	0	1
Wisconsin												
Kenosha	0	0		0	0	0	0	0	0	0	0	23
Milwaukee	0	0		0	4	0	0	19	6	0	0	41
Racine	0	0		0	1	0	1	1	1	0	0	2
Superior	0	0		0	2	0	0	1	0	0	0	2
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	0	7	4	0	0	0
Minneapolis	0	0		0	0	0	1	9	0	0	0	3
St Paul	0	0		0	0	0	5	13	4	0	0	26
Missouri												
Kansas City	0	0		0	0	2	6	0	1	0	3	0
St Joseph	0	0		0	0	0	0	0	1	0	0	0
St Louis	0	0		1	1	1	5	8	3	0	2	14

City reports for week ended September 2, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota												
Fargo	0	0		0	0	0	0	3	0	0	0	0
Nebraska												
Omaha	0	0		0	0	0	2	0	2	0	0	0
Kansas												
Topeka	0	0		0	0	0	2	0	2	0	0	10
Wichita	0	0		0	0	0	3	1	0	0	0	0
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	1	0	3	0	0	0	0
Maryland												
Baltimore	4	0		0	0	2	5	23	10	0	0	41
Cumberland	0	0		0	4	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		0	1	0	[illegible]	22	2	0	0	0
Virginia												
Lynchburg	0	0		0	0	0	1	23	0	0	0	0
Richmond	0	0		0	1	0	1	4	3	0	0	0
Roanoke	0	0		0	0	0	0	3	2	0	1	3
West Virginia												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	0	0	1	1	0	0	0	0
North Carolina												
Raleigh	0	0		0	1	0	0	0	1	0	0	0
Wilmington	0	0		0	0	0	0	1	0	0	0	4
Winston Salem	0	0		0	0	0	2	3	1	0	0	0
South Carolina												
Charleston	0	0		0	0	0	1	0	2	[illegible]	1	0
Georgia												
Atlanta	1	0	3	1	1	1	1	1	0	0	0	5
Brunswick	0	0		0	0	0	0	0	0	0	0	0
Savannah	0	0		0	0	0		0	1	0	1	2
Florida												
Tampa	2	0		0	0	0	0	0	0	0	1	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0		0	1	0	5	1	1	0	0	9
Nashville	0	0		0	0	0	1	0	0	0	0	0
Alabama												
Birmingham	1	0		0	0	0	3	0	2	0	0	3
Mobile	0	0	1	0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	1	1	0	0	0	0
Louisiana												
New Orleans	0	0	1	0	0	1	8	1	0	0	1	1
Shreveport	3	0		0	0	0	0	0	0	0	4	0
Texas												
Dallas	5	0		0	0	0	2	0	1	0	0	6
Galveston	0	0		0	0	0	3	0	0	0	0	0
Houston	0	0		0	0	0	2	1	1	0	1	0
San Antonio	0	1		0	0	0	1	1	0	0	0	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	0	0	0	0	0	2
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	1
Missoula	0	0		0	0	0	2	0	0	0	0	0
Idaho												
Boise	0	1		0	0	0	0	0	0	0	0	0
Colorado												
Denver	1	0		0	0	0	3	2	2	0	0	9
Pueblo	0	0		0	0	0	0	0	0	0	1	0
Utah												
Salt Lake City	0	0		0	3	0	0	0	2	0	0	9

City reports for week ended September 2, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	0	0		0	4	0	2	3	9	0	0	1
Spokane	0	0	1	1	8	0	2	1	0	0	0	0
Tacoma	0	0		0	4	0	3	0	0	0	0	0
California												
Los Angeles	2	0	3	1	11	1	1	5	9	0	0	7
Sacramento	0	0		0	0	0	6	1	3	0	0	1
San Francisco	2	0	2	0	17	2	3	2	11	0	0	0
Total	43	7	19	7	99	42	189	734	195	0	36	504
Corresponding week, 1943	46		20	13	211		234		216	0	35	836
Average, 1939–43	48		31	[1] 10	[2] 174		[1] 209	[illegible]	208	1	42	1,045

[1] 3 year average, 1941–43 [2] 5-year median

Anthrax.—Cases Camden, 1

Dysentery, amebic.—Cases New York, 1, Detroit, 1, Little Rock, 1, San Francisco, 2

Dysentery, bacillary.—Cases Providence, 1, New Haven, 1, Buffalo, 61, New York, 3, Chicago, 5, Detroit 2, St Louis, 1, Los Angeles, 4

Dysentery, unspecified.—Cases Baltimore, 7, Richmond, 2

Rocky Mountain spotted fever.—Cases St Louis, 1, Richmond, 1

Typhus fever, endemic.—Cases New York, 1, Wilmington, N C, 4 Atlanta, 1, Savannah, 5, Tampa, 1, Nashville, 1, Birmingham, 2, Mobile, 5, New Orleans, 3, Dallas, 3, Houston, 14, San Antonio, 4, Los Angeles, 1

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,380,700)

	Diphtheria case rates	Encephalitis infectious, case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.2	0.0		0.0	29	7.8	52.3	39.2	42	0.0	0.0	125
Middle Atlantic	3.7	2.3	1.4	0.5	7	7.4	23.6	205.0	26	0.0	6.5	50
East North Central	6.7	0.0	3.0	1.2	9	7.3	16.4	80.3	26	0.0	3.6	117
West North Central	0.0	0.0		2.0	2	6.0	47.7	81.6	34	0.0	9.9	105
South Atlantic	11.5	0.0	4.9	1.6	13	6.6	29.6	137.9	36	0.0	6.6	90
East South Central	11.8	0.0	5.9	0.0	6	0.0	59.0	5.9	18	0.0	0.0	71
West South Central	23.0	2.9	2.9	0.0	0	2.9	48.8	11.5	6	0.0	17.2	20
Mountain	7.9	7.9		0.0	24	0.0	39.7	15.9	32	0.0	7.9	167
Pacific	6.3	0.0	9.5	3.2	70	4.7	26.9	19.0	51	0.0	0.0	14
Total	6.5	1.1	2.9	1.1	15	6.4	28.7	111.6	30	0.0	5.5	77

PLAGUE INFECTION IN LASSEN AND SAN LUIS OBISPO COUNTIES, CALIFORNIA

Plague infection has been reported proved in tissue from 4 ground squirrels, *C. beecheyi*, taken on August 8, 1944, from a ranch 4½ miles north and 4 miles west of Milford, Lassen County, and in a pool of 200 fleas from 40 ground squirrels, *C. beecheyi*, proved positive September 6, and in tissue from 10 ground squirrels, same species, taken August 23 from a ranch 2 miles east of San Luis Obispo, San Luis Obispo County, Calif.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 19, 1944.—During the week ended August 19, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		6	1	27	27	6	3	17	13	100
Diphtheria		1	3	31	4	2	1			42
Dysentery (bacillary)				2						2
Encephalitis, infectious									2	2
Influenza					12	1			1	14
Measles		3	2	102	74	11	15	17		224
Meningitis, meningococcus		1		3	1		1		1	7
Mumps				16	5	3	8	14	13	59
Poliomyelitis		2	13	3	[1] 18	9			1	[1] 46
Scarlet fever		2	4	40	38	10	6	5	4	109
Tuberculosis (all forms)		1	21	133	51	9	21		46	282
Typhoid and paratyphoid fever		1		29	1				3	34
Undulant fever				2	1					3
Whooping cough		36		63	52	3	16	11	37	218
German measles				1	6		2		8	17

[1] Includes 2 cases in delayed reports

CUBA

Habana—Communicable diseases—4 weeks ended August 19, 1944.—During the 4 weeks ended August 19, 1944, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	1		Malaria	3	
Diphtheria	19		Measles	7	
Dysentery	4		Tuberculosis	3	2
Leprosy	1		Typhoid fever	40	

Provinces—Notifiable diseases—4 weeks ended August 12, 1944.—During the 4 weeks ended August 12, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara [2]	Camaguey	Oriente	Total
Cancer		3	4	8	2	7	24
Cerebrospinal meningitis				1			1
Chickenpox						2	2
Diphtheria	1	28	2				31
Dysentery		2					2
Hookworm disease		29					29
Leprosy		1		1			2
Malaria	10	7	7	10	2	294	330
Measles	1	6		8		1	16
Poliomyelitis	1	1					2
Tetanus, infantile			1				1
Tuberculosis	14	34	9	31	13	38	139
Typhoid fever	13	66	13	119	26	59	296
Whooping cough	1						1

[1] Includes the city of Habana

[2] For the week ended July 8, 1944, 1 case of human rabies was reported in Santa Clara Province

JAMAICA

Notifiable diseases—4 weeks ended August 26, 1944.—During the 4 weeks ended August 26, 1944, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Poliomyelitis		1
Chickenpox	6	11	Scarlet fever		1
Diphtheria	2	5	Tuberculosis	31	45
Dysentery		3	Typhoid fever	13	58
Erysipelas		1	Typhus fever	9	
Leprosy		3			

NEW ZEALAND

Notifiable diseases—4 weeks ended August 12, 1944.—During the 4 weeks ended August 12, 1944, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Puerperal fever	7	
Cerebrospinal meningitis	19	2	Scarlet fever	932	2
Diphtheria	97	2	Tetanus	2	
Dysentery (bacillary)	17		Trachoma	6	
Erysipelas	28		Tuberculosis (all forms)	187	63
Leprosy	1		Typhoid fever	7	
Lethargic encephalitis	1		Undulant fever	3	
Malaria	72				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Bolivia—Chuquisaca Department—Muyupampa.—For the month of July 1944, 1 case of plague with 1 death was reported in Muyupampa, Chuquisaca Department, Bolivia.

French West Africa—Dakar.—For the week ended August 26, 1944, 36 cases of plague with 32 deaths were reported in Dakar, French West Africa.

Palestine—Haifa.—For the week ended August 19, 1944, 8 cases of plague were reported in Haifa, Palestine.

Smallpox

Bolivia.—For the month of July 1944, 103 cases of smallpox with 44 deaths were reported in Bolivia. Departments reporting the highest incidence of the disease are as follows: La Paz, 54 cases, 31 deaths, including 34 cases and 21 deaths in La Paz city; Potosi, 42 cases, 13 deaths, including 32 cases and 11 deaths in Potosi city; Cochabamba, 4 cases.

Typhus Fever

Bolivia.– For the month of July 1944, 58 cases of typhus fever with 11 deaths were reported in Bolivia, including 12 cases and 1 death in Cochabamba Department and 39 cases and 7 deaths in Potosi Department.

Egypt.—For the week ended August 5, 1944, 124 cases of typhus fever with 16 deaths were reported in Egypt.

Hungary.—For the week ended August 19, 1944, 25 cases of typhus fever (including 15 cases in Subcarpathia) were reported in Hungary.

Yellow Fever

Gold Coast—Tamale.—On August 20, 1944, 1 fatal case of suspected yellow fever was reported in Tamale, Gold Coast.

Ivory Coast—Abidjan.—For the period August 1–10, 1944, 1 fatal case of yellow fever was reported in Abidjan, Ivory Coast.

* * *

COURT DECISION ON PUBLIC HEALTH

Ordinance prohibiting sale of milk or cream in bottles of other than specified size upheld.—(United States Circuit Court of Appeals, 10th Circuit; *Independent Dairymen's Association, Inc.*, v. *City and County of Denver et al.*, 142 F.2d 940; decided May 15, 1944; rehearing denied June 26, 1944.) A 1943 ordinance of the city and county of Denver provided that milk or cream, when sold in bottles, could be sold in 2-quart, quart, pint, half-pint, quarter-pint, or 10-ounce bottles but prohibited the sale of milk or cream in bottles of any other size or capacity. Three creameries were engaged in the bottling, sale, and distribution of milk and cream in standard gallon-size bottles in the city and county and these creameries and a dairymen's association brought an action in the United States District Court for a judgment declaring the ordinance to be null and void and enjoining its enforcement. The trial court entered a judgment dismissing the action but granted an injunction against the enforcement of the ordinance until the determination of an appeal to the United States Circuit Court of Appeals.

The latter court stated that it was common knowledge that milk was easily contaminated and that contaminated milk was a prolific source of disease. The regulation of the sale and distribution of milk, it said, was within the police power of the city and it then proceeded to quote from a prior case to show the extent to which the sale and distribution of milk could be regulated under the police power. The evidence adduced at the trial established the following facts: When milk was first sold in gallon bottles in Denver a small-mouthed bottle, which was difficult to thoroughly clean and sterilize, was used; shortly thereafter, dairymen, after a conference with municipal representatives, agreed to eliminate the use of small-necked bottles, to use large-necked bottles, and to install mechanical equipment for capping; experience demonstrated, however, that large-necked bottles were also difficult to clean and sterilize and that mechanical capping equipment would not work well on such bottles; the caps did not seat perfectly and the operator's thumb was frequently used to seat them, and, after sterilization, the dairy employees were disposed to insert their fingers in the top of the bottles when handling them; such practices subjected the milk to danger of contamination from the employees' hands; when smaller bottles were used this was not true; when heated to a high temperature gallon bottles often broke and there was a temptation to neglect complete sterilization in order to avoid breakage; large-mouthed gallon bottles had a tendency to chip and break around the mouth; half-gallon and smaller bottles were more readily sterilized, were less apt to chip and break, could be capped without the use of human hands, and were less apt to be contaminated in handling.

The circuit court of appeals concluded that the plaintiffs had failed to establish that a rational factual basis for the requirements of the ordinance was so wanting as to render it unreasonable and arbitrary or that the classification was without any rational basis or was essentially arbitrary. On the contrary, the court, in the light of the proven facts, was of the opinion that the ordinance had a legitimate relation to the protection of the public health and was a proper exercise of the police power of the city and county.

The injunction during the litigation, granted by the trial court, was ordered dissolved and the judgment of the trial court dismissing the action was affirmed.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

VOLUME 59 SEPTEMBER 29, 1944 NUMBER 39

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Public Health Reports

Vol. 59 • SEPTEMBER 29, 1944 • *No. 39*

SICKNESS ABSENTEEISM AMONG MALE AND FEMALE INDUSTRIAL WORKERS DURING 1943, AND AMONG MALES DURING THE FIRST AND SECOND QUARTERS OF 1944, WITH A NOTE ON THE RESPIRATORY EPIDEMIC OF 1943–44 [1]

By W. M. GAFAFER, *Principal Statistician, United States Public Health Service*

The quarterly reports for the year 1943 on the frequency of sickness and nonindustrial injuries causing disability for 8 consecutive calendar days or longer among a group of over 265,000 male members of industrial sick benefit organizations have appeared (*1–4*), the organizations including sick benefit associations, group insurance plans, and company relief departments. The present report is concerned with the experience of male and female workers during 1943 and earlier years, and of males during the first and second quarters of 1944, an inquiry also being made into the respiratory epidemic of 1943–44. The last report of the series referring to the experience among females appeared in 1943 (*5*) and covers the 10 years 1933–42.

MALES AND FEMALES, 1943 AND EARLIER YEARS

Year 1943.—Table 1 shows for males and females the frequency rates by cause for 1943, 1942, and the 10-year period 1934–43, the corresponding rates for the single years 1934–41 appearing in reference *5*. The male rate of 138.1 in 1943 for all causes is the highest recorded annual rate of the 10 years and is 43 percent in excess of the 10-year average of 96.7. The female rate of 204.1 for 1943 for all causes is likewise the highest recorded annual rate since 1934 and is 31 percent greater than the 10-year average of 155.4. In each year of the past 10 years, 1934–43, the female rate for all causes and each of the broad cause groups (exclusive of nonindustrial injuries) is higher than the corresponding male rate, the largest excess in the total frequency (84 percent) occurring in 1934 and the smallest (48 percent) in 1943.

Years 1934–43.—The 10 annual rates for all causes and the broad cause groups are shown graphically in figure 1. It will be observed that in 1943 the rates for all causes, as well as the male rates for the

[1] From the Industrial Hygiene Division, Bureau of State Services

TABLE 1.—*Average annual number of absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by sex and cause, experience of* MALE *and* FEMALE *employees in various industries, 1943, 1942, and 1934–42, inclusive* [1]

Cause. (Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939)	Annual number of absences per 1,000 persons					
	Males			Females		
	1943	1934–43 [2]	1942	1943	1934–43 [2]	1942
Sickness and nonindustrial injuries	138.1	96.7	106.1	204.1	155.4	168.4
Percent of female rate	*68*	*62*	*63*			
Percent of male rate				*148*	*161*	*159*
Nonindustrial injuries (169–195)	11.9	11.6	11.7	11.3	13.0	12.8
Sickness	126.2	85.1	94.4	192.8	142.4	155.6
Respiratory diseases	66.6	37.5	41.4	100.1	63.2	63.9
Tuberculosis of respiratory system (13)	.8	.8	.8	.6	.7	.6
Influenza and grippe (33)	29.7	16.8	15.7	43.9	27.2	19.0
Bronchitis, acute and chronic (106)	10.4	5.2	6.5	10.8	7.8	8.3
Pneumonia, all forms (107–109)	8.8	3.7	5.5	4.2	1.9	2.9
Diseases of pharynx and tonsils (115b, 115c)	6.7	5.1	5.4	14.5	12.7	13.4
Other respiratory diseases (104, 105, 110–114)	10.2	5.9	7.5	26.1	12.9	19.7
Digestive diseases	17.5	14.3	16.1	29.0	24.1	25.5
Diseases of stomach except cancer (117, 118)	5.9	4.1	4.7	2.8	2.5	2.4
Diarrhea and enteritis (120)	2.1	1.4	1.8	3.8	2.7	3.1
Appendicitis (121)	4.6	4.4	5.0	16.4	12.6	13.5
Hernia (122a)	2.0	1.6	1.9	.2	.4	.4
Other digestive diseases (115a, 115d, 116, 122b–129)	2.9	2.8	3.0	5.8	5.9	6.1
Nonrespiratory-nondigestive diseases	37.7	30.8	34.4	59.0	50.7	62.0
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [3]	2.4	2.4	2.5	5.2	3.8	4.8
Cancer, all sites (45–55)	.4	.5	.4	.4	.4	.5
Rheumatism, acute and chronic (58, 59)	4.5	4.0	3.9	2.9	3.2	3.1
Neurasthenia and the like (part of 84d)	1.6	1.1	1.1	9.7	6.5	8.6
Neuralgia, neuritis, sciatica (87b)	2.7	2.2	2.2	1.8	2.3	2.8
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	1.5	1.2	1.2	.9	1.1	1.1
Diseases of heart (90–95)	3.2	2.6	2.7	1.7	1.6	1.4
Diseases of arteries and high blood pressure (96–99, 102)	1.6	1.1	1.2	.8	.7	.9
Other diseases of circulatory system (100, 101, 103)	.7	2.4	3.1	3.4	2.8	3.7
Nephritis, acute and chronic (130–132)	.5	.4	.4	.3	.3	.0
Other diseases of genitourinary system (133–139)	2.7	2.5	2.6	12.6	10.4	11.6
Diseases of skin (151–153)	3.2	2.9	3.1	4.5	3.6	4.6
Diseases of organs of movement except diseases of joints (156b)	.5	2.9	3.0	3.7	2.2	3.7
All other diseases (56, 57, 60–79, 88, 89, 154, 155, 156a, 157, 162)	6.2	4.6	7.0	11.1	11.8	15.2
Ill defined and unknown causes (200)	4.4	[illegible]	2.2	4.7	4.4	4.2
Average number of persons	293,960	2,127,104	287,548	26,519	175,021	18,835

[1] Industrial injuries and venereal diseases are not included.
[2] Average of the 10 annual rates.
[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

three broad sickness groups, and the female rates for the respiratory and digestive groups of diseases have never been equalled or exceeded in the 10-year period. Of particular interest is the striking increase in frequency in 1943 of the respiratory group of diseases, the male and female rates being 61 and 57 percent in excess of the corresponding rates for 1942, and 78 and 58 percent in excess of their 10-year means.

It will be noted in table 1 that four respiratory causes, namely, influenza and grippe; bronchitis, acute and chronic; pneumonia, all forms; and "other respiratory diseases," including colds, sinusitis, laryngitis, pleurisy, asthma, and "respiratory infection," are chiefly responsible for the increased total respiratory rate. The variation of the frequency of these specific causes throughout the 10-year period is presented graphically for each sex in figure 2. For both

males and females the 1943 rate for each cause is the highest recorded rate of the 10 years, the percentage excesses over the corresponding 10-year means being for males and females, respectively: influenza and grippe, 77 and 61 percent; bronchitis, acute and chronic, 100 and

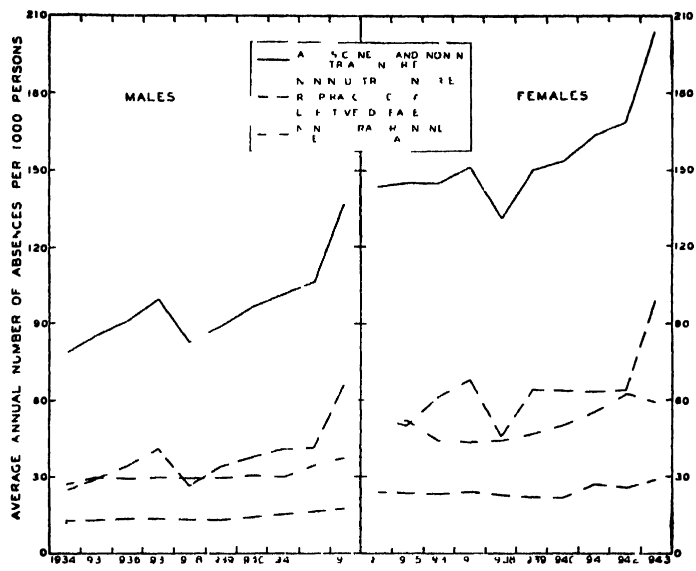

FIGURE 1.—Average annual number of absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by sex and broad cause group; variation of rates with time, experience of MALE and FEMALE employees in various industries, 1934–43, inclusive

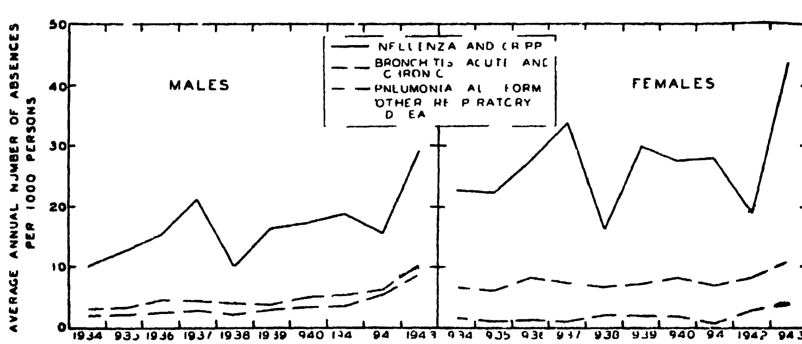

FIGURE 2.—Average annual number of absences per 1,000 persons on account of selected respiratory causes disabling for 8 consecutive calendar days or longer, by sex, variation of rates with time, experience of MALE and FEMALE employees in various industries, 1934–43, inclusive

38 percent; pneumonia, all forms, 138 and 121 percent; and "other respiratory diseases," 73 and 102 percent. Noteworthy is the almost parallel course of the male curves for pneumonia, bronchitis, and "other respiratory diseases" generally rising since 1938, and the increase over the 10 years in the female frequency of "other respiratory

diseases," the 1943 rate being three and one-half times the rate for 1934.

Absence duration, 1941–43—Table 2, covering only those organizations reporting absences by duration, shows by sex the frequency of ended absences from all causes disabling for the indicated number of calendar days or longer. The rates for a particular year indicate the ability of absences beginning in that year to continue to contribute to the frequency rate as the lower limit of duration is increased In general, the presence of a relatively large number of absences of long duration is reflected in a relatively slow decline in the rates for a particular year For both males and females each of the 1943 rates is higher than the corresponding rate for 1942; among males the frequency of 8-day or longer absences is 33 percent greater than the 8-day or longer frequency for 1942, while the 1943 frequency of absences of 92 days or longer is 22 percent greater than the 1942 rate, the corresponding percentage excesses for the females being 25 and 9. A comparison of the year 1943 with 1941 shows excesses for the males, while for females the excesses become slight defects beyond durations of 57 days or longer Thus the year 1943, for both males and females, is characterized by a relatively large number of absences of long duration.

TABLE 2—*Average annual number of* ENDED *absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for the indicated number of consecutive calendar days or longer, experience of male and female employees of companies* REPORTING ABSENCES BY DURATION, *absences beginning during 1941 1942, and 1943* [1]

Duration of absences in days	Annual number of absences per 1 000 persons					
	Year in which absences began					
	1941	1942	1943	1941	1942	1943
	Males			Females		
8 days or longer	111.2	124.0	164.7	165.5	169.5	212.0
15 days or longer	66.4	75.2	94.7	108.8	109.0	126.8
22 days or longer	47.6	53.2	65.7	81.1	78.3	89.6
29 days or lonegr	36.3	41.1	50.0	64.1	60.2	69.1
36 days or longer	28.7	32.5	38.9	50.8	46.5	55.6
43 days or longer	22.6	26.2	31.0	41.0	37.8	44.5
50 days or longer	18.1	21.3	24.8	32.4	29.5	32.9
57 days or longer	15.2	17.4	20.6	25.7	23.2	26.1
64 days or longer	12.8	14.9	17.5	21.8	20.1	21.6
71 days or longer	10.8	12.7	15.1	18.7	17.2	18.2
78 days or longer	9.9	12.0	14.3	17.9	16.3	17.0
92 days or longer	7.7	9.0	11.0	14.3	12.2	13.3
Not ended absences [2]	1.7	2.1	2.0	2.2	2.2	1.7
Total, ended and not ended absences	112.9	126.1	166.7	167.7	171.7	213.7

[1] Industrial injuries and venereal diseases are not included

[2] Termination not reported prior to June 1 of the following year

In each year and for each of the indicated duration periods the female rate is higher than the male rate, the differences tending to decrease as absences of shorter duration drop out.

MALES, FIRST AND SECOND QUARTERS

Year 1944.—The morbidity experience of males for the first and second quarters of 1944 and 1943 is given in table 3. In both the first and second quarters of 1944 the rate for all causes maintained the high level recorded for 1943. Interest in the first quarter centers around the frequency of influenza and grippe, 29 percent above the rate for 1943, while in the second quarter the frequency of rheumatic diseases [3] is noteworthy with an excess of 19 percent. Attention is also directed to the 1944 rates for diseases of heart and arteries, and nephritis, showing excesses over the rates for 1943 of 44 and 28 percent for the first and second quarters, respectively.

TABLE 3.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause, experience of* MALE *employees in various industries, the first and second quarters of 1944 compared with the first and second quarters of 1943, and the first half of 1944 compared with the first halves of the years 1939–43, inclusive* [1]

Cause. (Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939)	Annual number of absences per 1,000 males						
	Second quarter		First quarter		First half		
	1944	1943	1944	1943	1944	1943	1939–43
Sickness and nonindustrial injuries	122.5	126.2	172.0	164.9	147.9	145.2	119.3
Nonindustrial injuries (169–195)	9.7	11.0	12.1	12.8	10.9	11.9	11.2
Sickness	112.8	115.2	159.9	152.1	137.0	133.3	108.1
Respiratory diseases	44.6	56.0	94.5	97.7	70.2	76.5	56.4
Tuberculosis of respiratory system (13)	.9	1.1	.6	.5	.8	.8	.7
Influenza and grippe (33)	14.6	20.2	52.9	40.9	34.3	30.4	26.1
Bronchitis, acute and chronic (106)	8.4	9.1	11.5	16.7	10.0	12.8	7.9
Pneumonia, all forms (107–109)	5.9	9.2	11.1	16.2	8.5	12.6	7.0
Diseases of pharynx and tonsils (115b, 115c)	6.5	6.7	6.5	10.0	6.5	8.3	6.6
Other respiratory diseases (104, 105, 110–114)	8.3	9.7	11.9	13.4	10.1	11.6	8.1
Digestive diseases	18.3	16.5	17.4	14.7	17.8	15.6	15.2
Diseases of stomach except cancer (117, 118)	5.6	5.7	5.9	4.7	5.7	5.2	4.3
Diarrhea and enteritis (120)	2.5	1.7	2.2	1.6	2.3	1.6	1.4
Appendicitis (121)	4.8	4.4	4.2	3.8	4.5	4.1	4.8
Hernia (122a)	2.0	1.9	1.7	2.0	1.9	2.0	1.8
Other digestive diseases (115a, 115d, 116, 122b–129)	3.4	2.8	3.4	2.6	3.4	2.7	2.9
Nonrespiratory-nondigestive diseases	44.4	38.5	42.0	36.1	43.2	37.3	33.8
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [2]	2.9	3.4	2.4	2.7	2.6	3.0	2.8
Rheumatism, acute and chronic (58, 59)	6.1	4.9	5.8	4.4	6.0	4.7	4.4
Neurasthenia and the like (part of 84d)	2.0	1.4	1.8	1.2	1.9	1.3	1.1
Neuralgia, neuritis, sciatica (87b)	3.0	2.6	3.0	3.0	3.0	2.8	2.5
Other diseases of nervous system (80–85, 87 except part of 84d, and 87b)	1.8	1.4	1.6	1.5	1.7	1.5	1.2
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	6.8	5.3	7.5	5.2	7.2	5.3	4.8
Other diseases of genitourinary system (133–138)	3.4	2.8	3.3	2.5	3.4	2.6	2.5
Diseases of skin (151–153)	3.8	3.1	2.9	2.7	3.3	2.9	2.6
Diseases of organs of movement except diseases of joints (156b)	4.1	3.6	3.2	3.5	3.6	3.5	3.1
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	10.5	10.0	10.5	9.4	10.5	9.7	8.8
Ill-defined and unknown causes (200)	5.5	4.2	6.0	3.6	5.8	3.9	2.7
Average number of males	244,065	271,998	256,806	265,428	250,436	268,713	222,772
Number of organizations	17	18	17	18	17	18	------

[1] Industrial injuries and venereal diseases are not included.
[2] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

[3] Rheumatism, acute and chronic; neuralgia, neuritis, and sciatica; and diseases of organs of movement except diseases of joints.

Years 1935–44.—The variation of the first- and second-quarter rates for the broad cause groups, and for influenza and grippe over the the 10 years 1935–44 are shown graphically in figure 3. In each quarter the rates for the digestive and nonrespiratory-nondigestive diseases have never been equalled or exceeded during the 10-year

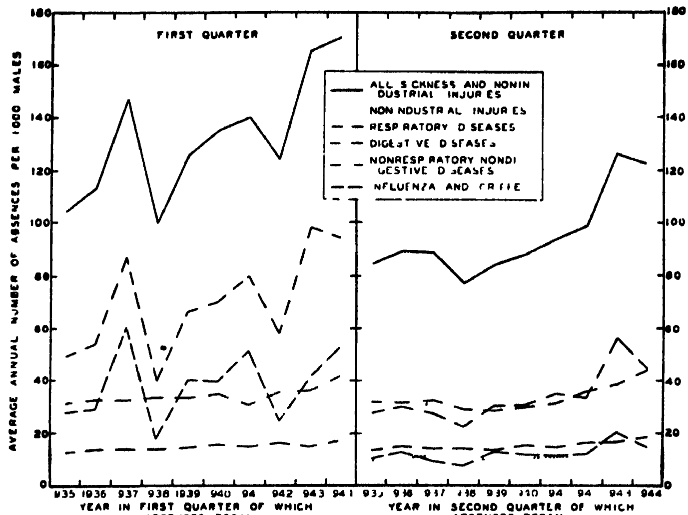

FIGURE 3.—Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by broad cause group, variation of first and second quarter rates with time, experience of MALE employees in various industries 1935–44, inclusive

period, the 1944 frequency of respiratory diseases in each quarter being surpassed only by the corresponding frequency for 1943.

RESPIRATORY EPIDEMIC, 1943–44

A small contribution to the epidemiology of the respiratory epidemic of 1943–44, in terms of three general morbidity indexes, is afforded by the use of data generously made available by seven plants in the eastern United States. The plants reported daily information on sickness and sickness absenteeism occurring among their employees during the period November 1943 to January 1944. Of these plants two were located in Washington, two in Pittsburgh, and one each in Baltimore, Boston, and New York. The effect of the respiratory epidemic on the three indexes, based on all sickness and nonindustrial injuries, is shown graphically in figure 4, the time period extending from November 22, 1943, through January 15, 1944. The indexes for those days, namely, Sunday, or Saturday and Sunday, on which plants did not work with a full labor force are not shown graphically. However, the curves are made continuous by connecting the points for Saturday and Monday, or for Friday and Monday.

The uppermost part of figure 4 shows the daily percentage of workers out sick for those plants whose data permitted the computation of this index. These plants include the two in Washington, one of two in Pittsburgh, and the one in Boston. The middle part of the figure presents for the Baltimore plant only the daily percentage of workers visiting the plant infirmary, while the lowermost part shows for the second Pittsburgh plant, the New York plant, and the Boston plant, the daily percentage of workers becoming incapacitated for work.

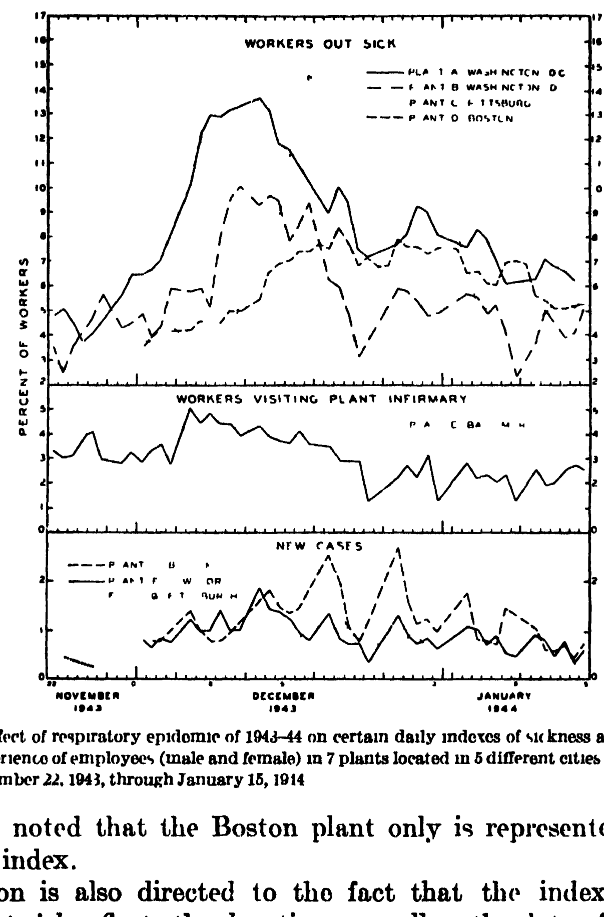

FIGURE 4.—Effect of respiratory epidemic of 1943–44 on certain daily indexes of sickness and nonindustrial injuries, experience of employees (male and female) in 7 plants located in 5 different cities of eastern United States, November 22, 1943, through January 15, 1944

It will be noted that the Boston plant only is represented by more than one index.

Attention is also directed to the fact that the index based on *workers out sick* reflects the duration, as well as the date of beginning, of the absence, while the index representing *new cases* reflects only the date of beginning of the absence. Thus for a particular day and plant, in a universe of one-day absences, the magnitudes of these indexes are equal.

Workers out sick.—The occurrence, chiefly in December, of relatively high values of the different indexes is clearly shown in the figure. The daily percentages of workers out sick for the two Washington

plants (A and B) move at different levels but show a notable parallelism, the index for one plant (B) reaching the maximum peak of 10.1 on Saturday, December 11, and for the other (A) 13.7 on Monday, December 13. The maximum peak of 14.6 in Pittsburgh is reached almost a week later on Saturday, December 18. The relatively flat curve of the Boston plant shows a maximum peak of 8.4 which appeared still later on Tuesday, December 21. Thus, of interest are the parallelism of the two Washington curves, the lag of the Pittsburgh and Boston curves, and the relative flatness of the Boston curve.

Workers visiting plant infirmary.—The daily percentage of workers visiting the plant infirmary was determinable for the Baltimore plant only. The movement of this index is extremely interesting in that it shows the epidemic in terms of nondisabling sickness and injuries. A maximum peak of 4.1 was reached on Friday, November 26, the previous minimum being 3.0 on Tuesday, November 23. The maximum peak of 5.0, after a series of fluctuating movements, was attained on Monday, December 6, following which there was a gradual decline in the movement of the index.

New cases.—The daily percentage of workers becoming disabled was computable for three plants. Attention is directed to the relatively large number of maximum values of the index occurring on Mondays, showing the effect of Sundays, or Saturdays and Sundays, on which days a full working force was not at the plants. The general movement of the index for each plant, however, is noteworthy. It will be observed that the maximum peak for the Pittsburgh plant (G) is not unreasonable when compared with the percentage of workers out sick for the other plant in Pittsburgh (C). The highest value of the index for the New York plant occurs approximately at the time of the maximum peak for the percentage of workers out sick in Washington. The Boston index of new cases shows considerable fluctuation but its general movement agrees well with the movement of the plant's percentage of workers out sick.

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A MEASUREMENT OF THE TOXICITY TO MOSQUITO LARVAE OF THE VAPOR OF CERTAIN LARVICIDES [1]

By M. A. BARBER, *Volunteer Worker, United States Public Health Service*

That the vapor of certain larvicides may be toxic to mosquito larvae has been long known. For example, Ramsay and Carpenter (*1*) mention the fact that mosquito larvae and pupae exposed to petrol vapor overnight under a bell jar are killed—"purely an effect caused by breathing."

The aim of the present work was to devise a simple apparatus for the study of the action on mosquito larvae of certain vapors and to measure approximately that effect. Such technique requires the presence of vapors in a sufficient degree of intensity and constancy and in a device which excludes any factor other than the vapor. The following apparatus seems to meet these requirements and is very simple in construction and operation.

From the tip of a folded circular filter paper 11 cm. in diameter, approximately 15 mm. are clipped off. The paper is then unfolded and placed in the bottom of a petri dish 90 mm. in diameter and pressed into close contact with the bottom and sides of the dish by means of an Erlenmeyer flask, a beaker, or any convenient close-fitting utensil. On removal of the flask or beaker the bottom and sides of the petri dish are lined with the filter paper, except for a circular opening in the bottom about 30 mm. in diameter. Mosquito larvae to be tested are pipetted into an ordinary watch glass about 50 mm. in diameter with a rounded base. The filter paper is then saturated with the larvicide to be tested, and the watch glass containing the larvae immediately placed inside and over the opening at the bottom of the petri dish. The lid of the petri dish is then replaced and the apparatus is ready for use. The window at the bottom of the apparatus makes it convenient to study the larvae, and the dish is so shallow that larvae may be examined with the naked eye, with a hand lens, or on the stage of a compound microscope. The intensity of the vapor can be roughly estimated by the amount of surface of the liquid larvicide exposed.

For convenience and for some special purposes certain changes in the procedure may be employed:

Paper other than filter paper may be used if it is more convenient. We have used papers of the cleansing tissue or paper towel type. These papers should be absorbent and for comparison of larvicides the same type of paper should be used for a whole series. The more folds in the paper the greater the surface of the larvicide exposed, and for special experiments requiring a greater vapor intensity, the top of the petri dish may be lined with paper similarly perforated.

[1] From the Office of Malaria Investigations, National Institute of Health.

Canton flannel in place of the paper was found to be less convenient and offered no special advantages. Of course, a large petri dish with two or more openings in the lining paper may serve for comparing larvae of different instars or of different species all in the same vapor. The smaller petri dishes are more conveniently observed on the stage of a microscope. After the application of the larvicide it is well to add a wetted pledget of cotton or piece of filter paper in order to prevent the drying up of the water in the larva culture, a precaution especially useful with certain larvicides After the preliminary examination the petri dish may be covered with a bell jar to maintain a constant degree of moisture or vapor.

Controls are prepared in a similar manner. We always include a control of larvae in a petri dish with the paper wet with water only, and usually one with kerosene. The sample of kerosene is first standardized with respect to the action of its vapor on larvae and serves as a basis of comparison with different larvicides.

The selection of the mosquito larvae which are to serve as tests is important. The younger the larvae the more sensitive to vapor, and anophelines are more sensitive than culicines, possibly on account of the more frequent intake of vapor in anophelines. Culicines are more active in cultures than anophelines, and, since muscular activity is affected by larvicide vapor, they offer a better measurement of vapor effect than do anophelines. As a standard we commonly used larvae of *Aedes aegypti* 2 days old. A fresh batch was prepared every day to insure an abundant supply always on hand. Temperature is also a factor; the higher the room temperature the more pronounced the vapor effect.

The characteristic movements of the larvae in a culture offer one of the best criteria of the vapor effect. *Aedes aegypti* larvae usually move freely from one side of the dish to the other. The first effect of a toxic vapor is to inhibit this movement. Spasmodic movements continue for a time, then larvae become wholly inert. These movements permit the use of two convenient standards: The time required for a vapor to render the larvae "NT," nontraveling, i. e., not exhibiting the movement of translation, and that required to render them inert. Larvae of the same batch vary greatly in respect to size and activity and the same is true of their reaction to vapors; we therefore usually measure the earlier effect on the majority rather than on all the larvae. It is advisable to include 10 or more larvae to each watch glass, as it may be desirable to distinguish four classifications: "majority NT," "all NT," "majority inert," "all inert." We can express results in terms of the number of minutes required for a given vapor to produce any of these measurable effects at a given temperature, and we can express vapor toxicity as a fraction with the number of minutes required to attain a certain effect (as "NT") with the given

vapor as the numerator and that of a standardized kerosene as the denominator. The most sensitive single criterion would be the number of minutes required to render small larvae "NT."

Further manifestations of vapor effect can be utilized for study of vapors if not for their standardization. For example, some vapors, as that of kerosene, will render larvae inert but the larvae will revive when placed in a moist chamber free from vapor. Other vapors, as that of benzene, are quickly fatal. The rapidity of the heartbeat of the larvae may also be observed by placing a small petri dish on the stage of a compound microscope.

We had planned to use this technique as a means of testing different petroleums or other liquid larvicides to be used as films on mosquito-breeding places. If such test is to be useful the toxicity of the vapor of a larvicide would have to approximate its toxicity as a film, the reason for using a vapor instead of the film itself in testing a larvicide being its greater convenience.

Work of more immediate wartime value interfered with these tests. Enough was done to indicate that such vapor tests may have some value in the standardization of larvicides. At all events, it appears that this apparatus is useful for the study of the physiology of larvae as regards their reaction to different vapors. For the observation of the heartbeat and other characteristics visible under the compound microscope the rounded watch glass seemed to be the most convenient, and the larvae are most conveniently got into the field of the microscope if only a small amount of water is pipetted into the watch glass with them. We used as a rule about $\frac{2}{10}$ cc. for the smaller larvae. All larvae containers may easily be modified to suit the study of larger larvae, anopheline, or culicine.

Certain sources of error should be kept in mind. Obviously the watch glass should be carefully lowered into the petri dish, if one is to avoid getting any liquid larvicide on the water surface, a precaution which should offer no difficulties. Again we must consider the possibility of the vapor forming a pellicle on the water surface which might act on larvae by liquid intake, contact, or other means, and that the observed effects are not due to vapor inhalation. This seems the less probable when the very rapid effect of vapors of carbon disulfide, gasoline, or benzene is considered. But we did some special experiments to test the matter: Larvae were exposed to certain vapors until they became "NT" or inert. The watch glass was removed, fresh active larvae added to the inert ones, and the watch glass containing both sorts quickly placed in a fresh petri dish lined with paper wet with water only. The fresh larvae remained active, giving no indication of any effect by a pellicle or other factor left by the vapor. Nor could any trace of such pellicle be seen on the water surface during

the short time occupied by the experiment. So it is probable that the vapor acted directly on the larvae through inhalation.

A few of the results of vapor on larvae may be mentioned. The most rapid action evident in a period of less than a minute was observed in carbon disulfide. Almost as rapid were the vapors of toluene, carbon tetrachloride, and benzene. Slower but very rapid, acting within 2 or 3 minutes, were xylene and gasoline. Phenol, and the kerosene samples tested, required 12 to 30 minutes to attain the "NT" stage, fuel oil and Deobase much longer. Of course, different samples of the same reagent, such as kerosene, may vary in quality. As might be expected, certain vaporless larvicides, although highly toxic to larvae, showed no effect on larvae in this apparatus.

Kerosene vapor caused a slowing of the action of the larva heart with subsequent recovery, an effect somewhat like that of chloroform.

If ever the destruction of mosquito larvae by gases is contemplated, as might possibly be the case in the treatment of deep wells, reservoirs, or pits, the apparatus described might be useful in testing the toxicity of various gases.

SUMMARY

A very simple device for studying the action of vapors on mosquito larvae is here described.

REFERENCES

(1) Ramsay, G. C., and Carpenter, J. A.: An Investigation on Petroleum Oils for Malaria Control Purposes. Records of the Malaria Survey of India, Vol. III, No. 2, p. 216. Calcutta, 1932. Published for the Indian Research Fund Association by Thacker (1927–37).

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

August 13–September 9, 1944

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended September 9, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—The number of cases of meningococcus meningitis dropped from 712 during the preceding 4-week period to 536 for the 4 weeks ended September 9. The number of cases was

about 20 percent below that reported for the corresponding period in 1943, but it was 4.4 times the 1939–43 median. As the present epidemic of this disease has been in progress for about 2 years, the 5-year median falls within 1 of the 3 preceding low years for this disease. For the years 1934–38 the median for this period was 216 cases. The incidence was lower than in 1943 in all sections except the East South Central, but in each section the number of cases was considerably above the preceding 5-year median. The largest excesses were reported from the North Atlantic, East North Central, and Pacific regions.

Poliomyelitis.—The number of cases of poliomyelitis rose from 3,253 during the 4 weeks ended August 12 to 5,971 during the 4 weeks ended September 9. The number of cases was 1.7 times the number reported for the corresponding period in 1943 and 3.6 times the 1939-43 median. For the country as a whole the current incidence is the highest recorded for this period in the 16 years for which these data are available. Twelve States reported more than 80 percent of the total poliomyelitis cases, viz, New York 2,297 cases, Pennsylvania 539, Ohio 386, Michigan 344, Virginia 261, Minnesota 183, New Jersey 177, South Carolina 163, Illinois 154, Massachusetts 150 Maryland 149, and Kentucky 140 cases. The Mountain and Pacific sections have shown only the normal seasonal increase, but some States in every other section of the country have reported an unusually high incidence. In North Carolina where the outbreak first appeared the number of cases dropped from 94 during the week ended July 8 to 27 for the week ended September 9, in Kentucky the number dropped from 79 during the week ended July 29 to 33 for the week ended September 9, while in other States where the disease has been unusually prevalent the peak was not reached until the week ended September 2. During the week ended September 9 there were 200 fewer cases reported than occurred during the preceding week and for the country as a whole there was a further decline during the week ended September 16, the latest date available. The disease has declined in the 3 Atlantic Coast regions and in the East South Central States. The East North Central region reported the highest weekly incidence in that region during the week ended September 16, and while the numbers of cases were not large in the Mountain and Pacific regions they represent the highest incidence in those regions during the current epidemic.

Table 2 shows by weeks for each geographic section the cases reported during 1944, 1943, and 1941. The present epidemic started in North Carolina and, with the exception of a few States, has been confined mostly to the Atlantic Coast and East North Central regions. The epidemic of 1943 first appeared in the Pacific region and affected practically every section of the country except the South Atlantic

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period August 13–September 9, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	871	957	957	2,207	2,233	1,974	2,533	4,429	3,149
New England	21	12	13	11	3	3	228	343	349
Middle Atlantic	38	56	60	21	11	17	346	971	809
East North Central	95	113	113	74	84	95	481	1,497	631
West North Central	51	86	86	29	39	35	109	267	184
South Atlantic	204	265	300	628	816	831	329	337	191
East South Central	158	152	152	41	69	70	42	115	118
West South Central	171	128	150	1,178	986	563	168	219	165
Mountain	60	48	48	159	154	154	94	228	207
Pacific	73	97	48	66	71	71	736	452	380
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	536	650	122	5,971	3,481	1,648	2,746	3,255	2,740
New England	36	69	7	267	2 4	33	231	329	213
Middle Atlantic	166	169	30	3,013	258	258	392	423	429
East North Central	93	127	19	1,062	907	484	621	730	730
West North Central	38	46	14	360	570	209	222	283	283
South Atlantic	54	83	33	805	35	130	449	482	367
East South Central	48	32	15	214	75	80	162	217	217
West South Central	26	29	9	58	392	55	126	105	113
Mountain	10	17	4	55	306	42	138	385	114
Pacific	64	78	8	137	674	143	405	301	223
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	10	11	19	675	759	1,356	6,984	11,056	11,056
New England	0	0	0	34	39	35	580	503	765
Middle Atlantic	0	0	0	97	94	148	1,088	2,140	2,704
East North Central	0	8	10	75	93	158	1,719	3,260	3,260
West North Central	3	0	6	49	55	72	543	904	538
South Atlantic	3	0	2	120	150	300	1,189	1,725	1,297
East South Central	3	2	1	72	129	247	307	407	408
West South Central	0	1	2	178	149	275	742	692	631
Mountain	0	0	3	31	20	43	475	554	406
Pacific	1	0	1	19	30	43	341	871	871

[1] Mississippi and New York excluded New York City included
[2] Mississippi excluded

and West South Central sections, while the highest incidence in 1941 occurred in the Atlantic Coast and East South Central sections. There was no epidemic of this disease in 1942 and the number of cases for the comparative period totaled 2,398.

Scarlet fever.—For the 4 weeks ended September 9 there were 2,746 cases of scarlet fever reported, as compared with 3,255 for the corresponding period in 1943. For the first time in almost 2 years the incidence during a current 4-week period has fallen below the corresponding period in the preceding year. The incidence stood at the median level, which was represented by the 1942 figure. Five of the 9 geographic regions reported increases over the preceding 5-year medians, and in 4 sections the disease was less prevalent than in recent years.

TABLE 2.—*Number of cases of poliomyelitis reported in each geographic area during 1944, 1943, and 1941*[1]

Division	Total Jan 1–Sept 16	July 22	July 29	August 5	August 12	August 19	August 26	September 2	September 9	September 16	September 23	September 30
All regions												
1944	12,419	570	738	932	1,015	1,260	1,529	1,683	1,499	1,439		
1943	7,812	329	361	450	545	747	872	956	906	1,021	818	679
1941	5,798	246	302	326	422	549	611	624	586	505	596	592
New England												
1944	446	9	12	36	37	54	74	75	64	49		
1943	475	3	11	32	36	62	62	77	63	91	85	84
1941	233	0	4	16	7	22	21	40	27	48	37	33
Middle Atlantic												
1944	5,361	216	304	413	449	601	756	895	761	674		
1943	516	12	13	20	38	46	57	72	83	91	83	67
1941	1,240	17	21	32	60	111	173	163	169	213	210	210
East North Central												
1944	2,043	63	111	143	178	215	271	321	255	329		
1943	1,424	12	21	46	79	144	241	249	273	288	207	171
1941	790	13	30	45	58	81	82	102	71	93	96	117
West North Central												
1944	627	25	22	28	54	67	104	77	112	76		
1943	1,023	12	40	61	117	118	131	183	135	148	114	88
1941	278	7	10	10	13	24	17	32	38	28	37	32
South Atlantic												
1944	2,059	128	136	167	167	195	214	208	188	169		
1943	153	9	7	5	8	7	10	8	10	23	14	18
1941	1,473	128	113	122	127	139	139	133	115	80	79	81
East South Central												
1944	855	92	101	84	67	53	56	48	57	59		
1943	183	6	14	11	5	29	20	14	12	7	6	10
1941	1,279	74	103	78	134	145	147	121	132	86	93	83
West South Central												
1944	375	18	22	27	23	16	11	14	17	14		
1943	1,605	148	141	122	119	104	117	81	90	89	67	49
1941	179	4	8	10	10	10	11	13	8	12	9	12
Mountain												
1944	135	1	4	4	9	12	16	12	15	18		
1943	559	11	4	29	23	43	47	123	93	92	85	46
1941	92	2	4	3	3	5	2	9	11	13	8	5
Pacific												
1944	518	18	26	30	31	47	27	33	30	51		
1943	1,874	116	110	124	120	194	187	149	144	191	157	146
1941	234	1	9	10	10	12	19	11	15	22	27	19

[1] A similar table with earlier data appeared in PUBLIC HEALTH REPORTS for Aug 4, 1944 p 1024

Influenza.—The incidence of influenza during the current period was about normal for this season of the year, the number of cases (2,207) being about on the level with the incidence in 1943 and only about 200 cases above the 1939-43 median. Of the total cases, Texas reported 1,115, South Carolina 362, and Virginia 170—about 75 percent of the total cases were reported from those 3 States. In the New England section the number of cases (11) was 3 times the 1939–43 median and in the West South Central section the number (1,178) was twice the median, but in all other sections the incidence either closely approximated or fell considerably below the median.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended September 9 there were 871 cases of diphtheria reported, as compared with 957 in 1943. The 1939–43 median was represented by the 1943 figure. The largest

increases over the medians were reported from the West South Central, Mountain, and Pacific regions, with minor increases in the New England and East South Central sections. In the Middle Atlantic, North Central, and South Atlantic regions the incidence was considerably below the normal seasonal expectancy.

Measles.—The incidence of measles was also relatively low, 2,533 cases being reported during the current 4 weeks, as compared with 4,429 cases in 1943 and a median of 3,149 cases for the corresponding period in the 5 preceding years. The incidence was comparatively low in all sections except the South Atlantic, West South Central, and Pacific sections.

Smallpox.—The incidence of smallpox continued at a relatively low level, only 10 cases being reported during the 4 weeks ended September 9, which was less than one-third of the 1939–43 median. Three of the cases were reported from Georgia, but no more than 1 case was reported from any other State. For the country as a whole the current incidence is the lowest on record for this period. This disease has been exceptionally low for the past 5 years; the median for the years 1934–38 is 141 cases.

Typhoid and paratyphoid fever.—The number of cases (675) of this disease was about 90 percent of the number reported for the corresponding period in 1943 and less than 50 percent of the 1939–43 median. In the New England region the incidence stood at about the normal seasonal level, but in all other sections the incidence was comparatively low.

Whooping cough.—For the 4 weeks ended September 9 there were 6,984 cases of whooping cough reported, as compared with a 1939–43 median of approximately 11,000 cases. A few more cases than might normally be expected occurred in the West South Central and Pacific sections and in the West North Central section the current incidence closely approximated the 5-year median, but in all other sections the numbers of cases were relatively low. In the Middle Atlantic section the number of cases (1,088) was about 40 percent of the 5-year median and in the East North Central section the number (1,719 cases) was slightly more than 50 percent of the median.

MORTALITY, ALL CAUSES

For the 4 weeks ended September 9 there were 31,412 deaths from all causes reported to the Bureau of the Census by 93 large cities. The average number of deaths reported for the corresponding period in 1941–43 was 30,270. During the first week of the period (week ended August 19) the number of cases was 15.5 percent above the 3-year average, the next 2 weeks were below the average and in the last week the number of deaths was 2.2 percent above the preceding 3-year

average. For the 4-week period the average was higher than for the corresponding period in the 3 preceding years in all sections except the South Atlantic and East South Central; in the former region the number of deaths declined and in the latter the number was the same as the average.

The death rate from all causes among persons insured in the industrial department of the Metropolitan Life Insurance Co. for the first 7 months of the year (the latest data available) was 8.4, as compared with 8.1 and 7.5 for the corresponding period in the years 1943 and 1942, respectively.

INCIDENCE OF HOSPITALIZATION, AUGUST 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	August 1943	August 1944
1. Number of plans supplying data	71	74
2. Number of persons eligible for hospital care	10,821,657	13,670,371
3. Number of persons admitted for hospital care	109,425	133,758
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	119.0	115.5
5. Incidence per 1,000 persons, annual rate for the 12 months ending August 31	105.3	104.5

DEATHS DURING WEEK ENDED SEPTEMBER 16, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended September 16, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	7,793	7,979
Average for 3 prior years	7,729	
Total deaths, first 37 weeks of year	334,568	341,169
Deaths under 1 year of age	602	572
Average for 3 prior years	571	
Deaths under 1 year of age, first 37 weeks of year	22,850	24,603
Data from industrial insurance companies:		
Policies in force	66,723,443	65,829,690
Number of death claims	12,759	10,232
Death claims per 1,000 policies in force, annual rate	10.0	8.1
Death claims per 1,000 policies, first 37 weeks of year, annual rate	10.1	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPT. 23, 1944

Summary

Decreases in the incidence of poliomyelitis were recorded during the week ended September 23, 1944, in all areas of the United States except the New England, West North Central, and Mountain sections. A total of 1,159 cases was reported, as compared with 1,440 for the preceding week, 818 for the corresponding week last year, and a 5-year (1939–43) median of 599. The largest number of cases reported for a corresponding week for which records are available (since 1927) was 1,095 in 1931.

An aggregate of 1,004 cases, or about 87 percent of the total, was reported currently in the 17 States reporting 15 or more cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 34 (28), Connecticut 17 (12), Minnesota 45 (40), Missouri 15 (4), Virginia 48 (46), West Virginia 18 (10); *decreases*—New York 383 (497), New Jersey 40 (54), Pennsylvania 82 (123), Ohio 77 (118), Indiana 20 (24), Illinois 38 (44), Michigan 75 (112), Wisconsin 26 (31), Maryland 31 (54), North Carolina 24 (28), Kentucky 31 (40).

The total number of cases reported to date this year is 13,572, as compared with a 5-year median of 5,652, and 8,630 and 11,295, respectively, for the corresponding periods of last year and 1931. The total for the whole of 1943 was 12,439, and that for 1931 was 15,745.

Of a total of 120 cases of meningococcus meningitis, as compared with 126 last week and a 5-year median of 31, 63 occurred in the 6 States reporting 6 to 14 cases each. The cumulative total is 13,727, as compared with 14,331 (80 percent of the total for the year) for the same period last year and a 5-year median of 1,575.

Current reports of diphtheria, influenza, measles, scarlet fever, smallpox, typhoid fever, and whooping cough are below both the respective 5-year medians and the corresponding figures for last year.

Of a total of 159 cases of typhus fever, Texas reported 52, Georgia and Alabama 29 each, and Louisiana 14. The cumulative total is 3,600, as compared with 2,946 last year and a 5-year median of 2,025.

Deaths recorded for the week in 93 large cities of the United States totaled 8,025, as compared with 7,817 last week and a 3-year (1941–43) average of 7,871. The cumulative figure is 343,524, as compared with 350,471 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Sept 23, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report while leaders imply that although none was reported cases may have occurred

Division and State	Diphtheria: Week ended Sept 23, 1944	Diphtheria: Week ended Sept 25, 1943	Diphtheria: Median 1939-43	Influenza: Week ended Sept 23, 1944	Influenza: Week ended Sept 25, 1943	Influenza: Median 1939-43	Measles: Week ended Sept 23, 1944	Measles: Week ended Sept 25, 1943	Measles: Median 1939-43	Meningitis, meningococcus: Week ended Sept 23, 1944	Meningitis, meningococcus: Week ended Sept 25, 1943	Meningitis, meningococcus: Median 1939-43
NEW ENGLAND												
Maine	1	0	0		1		3	20	13		3	0
New Hampshire	0	1	0				3	5	0	0	1	0
Vermont	0	0	0				2	2	2	0	0	0
Massachusetts	3	4	4				26	31	1	1	16	3
Rhode Island	0	0	0	2			0	18	1	1	2	0
Connecticut	1	1	1	1	3	1	6	10	5	2	5	0
MIDDLE ATLANTIC												
New York	10	10	7	( )	3	3	17	43	4	13	17	3
New Jersey	4	1	1		1	3	9	31	32		5	1
Pennsylvania	5	8	8		2		51	2	2		15	3
EAST NORTH CENTRAL												
Ohio	7	5	6		4	4	5	27	11	3	5	0
Indiana	4	11	11	4	4	12	2	16	10	1	2	1
Illinois	6	6	15	4	1	4	8	13	13	11	19	2
Michigan [2]	3	6	1	2		2	1	110	22	4	5	1
Wisconsin	0	2	0	12	12	23	21	82	34	3	2	2
WEST NORTH CENTRAL												
Minnesota	13	8	4				4	36	9	2		0
Iowa	4	11	5		1	1	1	8	8	1	2	0
Missouri	1	3	9		2	1	5	0	3	11	3	1
North Dakota	7	2	1	1		1	1	41	2	0	0	0
South Dakota	7	1	1				0	0	1	0	0	0
Nebraska	0		4	4	3		1	1	3	1	0	0
Kansas	4	3	3	2	1	1	6	3	3	2	1	1
SOUTH ATLANTIC												
Delaware	0	0	0				0	1	2	0	2	0
Maryland	7	4	3			1	7	7		4	8	2
District of Columbia	2	0	1				1	0	1	1	1	0
Virginia	6	12	19	62	63	58	4	11	10	2	2	2
West Virginia	4	6	9	1	3	2	0	8	2	3	1	1
North Carolina	21	37	47				3	7		1	4	0
South Carolina	7	16	27	113	146	146	4	8		0	1	1
Georgia	14	26	3	7	6	6	5	2	3	0	0	0
Florida	10	6		2		2	8	2	2	1	0	0
EAST SOUTH CENTRAL												
Kentucky	11	10	11	1	1	1	0	1	4	4	2	0
Tennessee	12	25	15	5	16	16	3	3	4	1	4	2
Alabama	14	18	20	10	23	20	3	4		1	4	0
Mississippi [2]	19	5	13							1	0	1
WEST SOUTH CENTRAL												
Arkansas	6	4	10	21	12	9	2	2	2	1	0	0
Louisiana	13	5	8		1	2	2	4	3	2	1	1
Oklahoma	12	5	8	23	17	10	6	0	2	2	1	1
Texas	36	25	35	363	442	231	32	15	15	6	4	1
MOUNTAIN												
Montana	7	5	1	3		1	2	17		0	0	0
Idaho	0	0	0				1	4	4	0	0	0
Wyoming	0	0	0	3	2	2	1	12	7	0	0	0
Colorado	3		5	2	50	23	0	13	6	2	2	0
New Mexico	12	1	1				1	3	1	1	0	0
Arizona	1	3	1	34	28	30	2	[illegible]	8	1	1	0
Utah	0	0	0				5		2	0	0	0
Nevada	0	0	0				0	0	0	0	0	0
PACIFIC												
Washington	8	5	2	1	1		14	9	11	2	8	1
Oregon	3	3	3	2	3	6	19	11	18	0	9	0
California	17	12	13	10	12	12	107	35	43	11	14	1
Total	325	326	385	695	869	728	416	711	626	122	178	31
38 weeks	8,054	8,638	9,127	341,582	84,920	153,627	593,495	541,518	469,401	13,729	14,331	1,575

[1] New York City only

[2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended Sept 23, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Sept 23 1944	Sept 25 1943		Sept 23 1944	Sept 25 1943		Sept 23 1944	Sept 25 1943		Sept 23 1944	Sept 25, 1943	
NEW ENGLAND												
Maine	[illegible]	1	0	24	10	6	0	0	0	0	1	0
New Hampshire		2	1	0	2	2	0	0	0	0	0	0
Vermont	8	4	2	0	0	3	0	0	0	0	0	0
Massachusetts	34	29	6	68	97	51	0	0	0	4	11	2
Rhode Island	1	20	0	8	4	3	0	0	0	0	0	0
Connecticut	17	29	4	9	11	11	0	0	0	1	2	1
MIDDLE ATLANTIC												
New York	383	57	57	59	109	85	0	0	0	8	7	15
New Jersey	40	12	17	21	19	20	0	0	0	2	2	2
Pennsylvania	82	14	14	56	85	85	0	0	0	7	18	17
EAST NORTH CENTRAL												
Ohio	77	7	13	71	113	79	1	1	0	8	8	9
Indiana	20	10	10	19	32	28	2	0	0	4	5	6
Illinois	38	140	50	78	59	73	0	3	1	3	5	12
Michigan [1]	75	28	28	49	58	76	0	0	0	4	9	9
Wisconsin	26	22	6	52	73	49	0	1	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	[illegible]	23	23	[illegible]	29	[illegible]	0	0	0	1	1	2
Iowa	13	16	5	14	51	34	0	0	0	2	1	2
Missouri	15	10	5	[illegible]	29	18	0	0	0	6	4	13
North Dakota	3	1	1	5	3	4	0	0	0	0	0	0
South Dakota	1	2	0	1	14	11	0	0	0	1	0	0
Nebraska	3	10	10	3	10	10	0	0	0	0	0	0
Kansas	[illegible]	52	11	37	64	35	0	0	0	1	0	[illegible]
SOUTH ATLANTIC												
Delaware	8	2	1	1	1	4	0	0	0	1	0	1
Maryland [1]	31	3	[illegible]	11	16	[illegible]	0	0	0	1	4	4
District of Columbia	14	1	1	[illegible]	[illegible]		0	0	0	0	2	1
Virginia	48	2	4	[illegible]	28	20	0	0	0	4	11	11
West Virginia	18	3	3	44	60	34	0	0	0	6	2	9
North Carolina	24	1	3	44	90	63	0	0	0	1	4	7
South Carolina	2	0	2	6	6	[illegible]	0	0	0	5	4	6
Georgia	3	0	1	19	[illegible]	23	0	0	0	5	3	15
Florida	1	2	2	5	4	3	0	0	0	1	1	1
EAST SOUTH CENTRAL												
Kentucky	31	5	7	14	19	19	0	0	0	13	9	15
Tennessee	[illegible]	0	3	35	31	44	0	0	0	3	9	15
Alabama	1	1	1	27	18	26	0	0	0	0	4	6
Mississippi	9	0	1	10	3	3	0	0	0	5	3	6
WEST SOUTH CENTRAL												
Arkansas	1	4	2	11	3	6	0	0	0	7	2	14
Louisiana	5	4	2	4	5	4	0	0	0	11	7	17
Oklahoma	2	18	3	6	5	5	0	0	0	1	7	7
Texas	5	41	5	28	20	17	0	1	0	16	8	22
MOUNTAIN												
Montana	8	2	1	5	5	8	0	0	0	0	0	0
Idaho	0	4	0	12	0	3	0	0	0	0	2	2
Wyoming	0	1	1	4	4	2	0	0	0	0	0	0
Colorado	2	25	4	10	10	11	0	0	0	2	6	7
New Mexico	1	3	2	3	3	3	0	0	0	6	4	4
Arizona	9	4	2	4	2	2	0	0	0	0	3	2
Utah	0	42	2	4	12	4	0	0	0	0	1	1
Nevada	1	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	5	22	5	27	27	15	0	0	0	2	1	3
Oregon	12	18	8	28	16	6	0	0	0	4	0	1
California	9	117	10	80	79	66	0	0	0	3	4	8
Total	1 159	818	599	1 128	1 363	1 216	3	6	6	149	176	304
38 weeks	13 572	8 630	5 652	151,709	102 603	102 603	317	625	1,210	4 073	4,184	6,182

[1] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts, 4 New York, 3, Michigan, 1, South Carolina, 2, Georgia, 1 Louisiana, 1, Washington, 1, California, 1

Telegraphic morbidity reports from State health officers for the week ended Sept 23, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough, Week ended—Sept 23 1944	Whooping cough, Week ended—Sept 25 1944	Whooping cough, Median 1939-43	Week ended Sept 23 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	3	14	11	1	0	0	0	0	0	0	0	0
New Hampshire	0	2	3	0	0	0	0	0	0	0	0	0
Vermont	20	17	17	0	0	0	0	0	0	0	0	0
Massachusetts	79	64	123	1	0	1	0	1	0	0	0	0
Rhode Island	11	129	32	0	0	0	0	0	0	0	0	0
Connecticut	33	25	47	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	119	266	324	0	2	81	0	0	0	0	0	1
New Jersey	68	120	120	0	0	0	0	0	1	1	0	0
Pennsylvania	82	133	214	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	110	178	220	0	0	0	0	0	0	0	0	0
Indiana	10	51	25	0	0	0	0	0	0	1	0	0
Illinois	115	140	197	0	2	2	0	4	0	3	0	0
Michigan [3]	97	191	203	0	1	15	0	1	0	0	0	0
Wisconsin	145	204	199	0	0	10	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	40	36	49	0	3	1	0	1	0	0	0	0
Iowa	15	16	21	0	0	0	0	0	0	0	0	0
Missouri	9	16	16	0	0	0	1	1	0	0	0	0
North Dakota	6	31	10	0	0	0	6	1	0	0	0	0
South Dakota	3	5	5	0	0	0	0	0	0	0	0	0
Nebraska	3	2	8	0	0	0	0	0	0	0	0	0
Kansas	19	10	33	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	2	2	0	0	0	0	0	0	0	0	0
Maryland [3]	53	69	63	0	0	0	1	0	0		0	0
District of Columbia	1	19	17	0	0	0	0	0	0		0	0
Virginia	18	54	34	0	0	0	28	1	0	3	1	3
West Virginia	5	22	22	0	0	0	0	0	0	0	0	0
North Carolina	141	50	50	0	0	0	0	0	0	0	0	6
South Carolina	25	52	37	0	0	18	0	0	0	1	0	4
Georgia	20	7	10	0	0	3	0	0	0	0	0	29
Florida	29	16	6	0	0	0	1	1	0	0	0	11
EAST SOUTH CENTRAL												
Kentucky	58	31	58	0	0	0	0	0	0	1	1	0
Tennessee	32	36	24	0	1	0	11	0	0	1	2	3
Alabama	14	24	14	0	0	0	0	0	0	1	0	29
Mississippi				0	0	0	0	0	0	0	0	7
WEST SOUTH CENTRAL												
Arkansas	30	13	10	0	0	30	0	0	0	0	4	0
Louisiana	0	13	5	0	1	1	0	0	0	0	0	14
Oklahoma	7	9	5	0	0	0	0	0	0	2	0	0
Texas	108	156	93	0	19	377	9	1	0	0	0	52
MOUNTAIN												
Montana	54	36	12	0	0	0	0	1	0	0	0	0
Idaho	0	2	2	0	0	0	0	0	0	0	0	0
Wyoming	6	6	24	0	0	0	0	0	0	0	1	0
Colorado	10	96	35	0	0	1	0	2	0	0	0	0
New Mexico	3	9	18	0	0	2	3	0	0	0	0	0
Arizona	16	10	13	0	0	0	12	1	0	0	0	0
Utah	20	31	27	0	0	0	0	0	0	0	2	0
Nevada	0	0	0	0	0	0	0	0	1	0	0	0
PACIFIC												
Washington	11	51	34	0	0	0	0	0	0	0	0	0
Oregon	8	42	8	0	0	0	0	0	0	0	0	0
California	81	122	170	0	1	15	0	3	0	0	0	0
Total	1 737	2 634	2 722	2	30	561	322	19	2	14	11	159
Same Week 1943	2 634			1	46	435	213	15	0	4	9	170
Same Week 1942	136 936			0	29	2 785	209	18	0	6	9	146
38 Weeks 1944	71 887			34	1 275	16 656	6 637	491	23	430	430	3 600
38 Weeks 1943	145 326			48	1 582	12 414	6 047	540	19	408	655	2 946
38 Weeks 1942	136 936		[4] 139,425	63	847	9 357	5 296	420	35	[4] 427	709	[4] 2 025

[3] Period ended earlier than Saturday

[4] 5 year median 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended September 9, 1944

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	1	1	2	0	0	1
New Hampshire												
Concord	0	0		0	0	0	3	0	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	2	0		0	6	0	8	15	18	0	1	8
Fall River	0	0		0	1	0	0	0	1	0	0	4
Springfield	0	0		0	0	0	0	1	2	0	0	0
Worcester	0	0		0	1	0	3	0	4	0	0	6
Rhode Island												
Providence	1	0		0	4	0	3	0	2	0	0	5
Connecticut												
Bridgeport	0	0		0	0	1	0	3	0	0	0	0
Hartford	0	0		0	1	0	1	2	0	0	0	2
New Haven	0	0		0	0	0	0	0	0	0	0	6
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	1	1	45	1	0	1	1
New York	6	0		0	12	9	41	232	25	0	8	65
Rochester	0	0		0	5	0	0	21	1	0	0	11
Syracuse	0	0		0	0	0	2	6	4	0	0	8
New Jersey												
Camden	2	0		0	0	1	1	1	1	0	0	0
Newark	0	0	1	0	0	0	4	2	1	0	0	1
Trenton	0	0		0	0	0	1	0	1	0	0	0
Pennsylvania												
Philadelphia	0	0	4	0	5	1	9	34	2	0	2	10
Pittsburgh	0	0		0	0	1	4	9	1	0	0	7
Reading	0	0		0	1	0	1	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	2	0		0	0	1	0	22	2	0	0	5
Cleveland	0	0		0	2	0	8	22	10	0	0	16
Columbus	0	0		0	0	1	0	2	2	0	0	8
Indiana												
Fort Wayne	0	0		0	0	0	1	0	0	0	1	0
Indianapolis	2	0		0	1	0	2	0	1	0	0	10
South Bend	0	0		0	1	0	0	1	1	0	0	0
Terre Haute	0	0		0	0	0	0	0	0	0	0	0
Illinois												
Chicago	2	0		0	4	3	17	16	8	0	1	53
Springfield	0	0		0	0	0	0	0	1	0	0	0
Michigan												
Detroit	2	0		1	2	5	2	48	13	0	0	45
Grand Rapids	0	0		0	0	0	0	2	1	0	0	0
Wisconsin												
Kenosha	0	0		0	0	0	0	0	0	0	0	11
Milwaukee	0	0		0	3	1	1	10	5	0	0	30
Racine	0	0		0	1	0	0	0	0	0	0	14
Superior	0	0		0	3	0	0	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	1	0	0	3	3	0	0	6
Minneapolis	7	0		0	0	1	2	15	2	0	0	3
St Paul	0	0		0	0	0	4	11	3	0	1	28
Missouri												
Kansas City	0	0		0	1	0	6	1	2	0	1	0
St Joseph	0	0		0	0	0	0	0	1	0	0	0
St Louis	0	0		0	0	1	2	5	1	0	1	6
North Dakota												
Fargo	0	0		0	0	0	1	1	0	0	0	3
Nebraska												
Omaha	0	0		0	0	0	0	2	1	0	1	0
Kansas												
Topeka	1	0		0	0	0	0	0	0	0	0	3
Wichita	0	0		0	0	0	4	1	2	0	0	5

City reports for week ended September 9, 1944—Continued

	Diphtheria cases	Encephalitis infectious cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	2	5	0	0	0	0
Maryland												
Baltimore	1	0		0	1	1	2	16	[illegible]	0	0	[illegible]
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		0	[illegible]	1	[illegible]	1	[illegible]	0	0	4
Virginia												
Lynchburg	1	0		0	0	0	0	[illegible]	0	0	0	0
Richmond	0	0		0	0	0	1	4	1	0	0	3
Roanoke	0	0		0	0	0	0	[illegible]	1	0	0	0
West Virginia												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	0	0	0	1	0	0	0	1
North Carolina												
Raleigh	0	0		0	0	0	0	0	0	0	0	2
Wilmington	0	0		0	0	0	0	0	0	0	0	1
Winston Salem	0	0		0	0	0	1	2	[illegible]	0	0	0
South Carolina												
Charleston	0	0		0	0	1	0	0	0	0	0	0
Georgia												
Atlanta	0	0		0	0	1	4	0	1	0	0	0
Brunswick	0	0		0	0	1	0	0	0	0	0	0
Savannah	0	0		0	[illegible]	1	1	0	0	0	0	0
Florida												
Tampa	0	0		0	0	0	1	0	2	0	1	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0		0	0	0	3	1	1	0	1	1
Nashville	0	0		0	0	0	0	1	1	0	0	0
Alabama												
Birmingham	0	0		0	0	0	3	1	0	0	2	0
Mobile	0	0		0	0	1	2	0	1		1	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		1	[illegible]	0	[illegible]	0	0	0	0	0
Louisiana												
New Orleans	0	0		0		0		4	1	0		
Shreveport	1	0		0	0	0	1	0	0	0	[illegible]	0
Texas												
Dallas	3	0		0	0	0	1	[illegible]	1	0	3	1
Galveston	0	0		0	0	[illegible]		0	0	0	0	0
Houston	1	0		0	0	0	[illegible]	[illegible]	0	0	1	[illegible]
San Antonio	4	0		0	1	0	[illegible]	0	0	0	0	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	0	0	0	0	0	1
Great Falls	0	0		0	0	0	1	0	1	0	0	
Helena	0	0		0	0	0	0	0	1	0	0	[illegible]
Missoula	0	0		0	0	0	2	0	0	0	0	0
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	3	2	1	0	0	2	1	3	8	0	1	[illegible]
Pueblo	1	0		0	0	0	1	0	1	0	0	0
Utah												
Salt Lake City	0	0		0	0	0	2	0	0	0	0	3
PACIFIC												
Washington												
Seattle	0	0		0	1	0	4	0	[illegible]	0	0	2
Spokane	0	0		0	2	0	2	0	0	0	0	0
Tacoma	0	0		0	2	0	0	0	0	0	0	1
California												
Sacramento		0		0	[illegible]	1	1	1	1	0	0	0
San Francisco	2	0	1	0	[illegible]	2	3	0	12	0	0	1
Total	[illegible]	2	14	2	93	39						
Corresponding week 1943	43				138		[illegible]		210			
Average 1939-43	49				[2]119		[1]212		223			

[1] 3 year average 1941-43

[2] 5 year median 1939-43

Dysentery amebic Cases Boston 1 New York 2 Cleveland 1 Chicago 3 Denver 1

Dysentery bacillary Cases Providence 1 Buffalo [illegible] Syracuse 1 Chicago 2 Detroit 7 Charleston S C 23 Shreveport 1 Denver 3

Dysentery unspecified—Cases Richmond 1

Rocky Mountain spotted fever Cases Winston Salem 1 Missoula, 1

Typhus fever endemic—Cases Milwaukee 1 Charleston S C, 2 Atlanta 2 Brunswick 1 Savannah 4 Tampa, 6 Nashville, 1, Mobile, 3, New Orleans, 6 Galveston 1 Houston 6 San Antonio, 3

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 32,538,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7 8	0 0		0 0	34	2 6	49 7	57 5	76	0 0	2 6	84
Middle Atlantic	3 7	0 0	2 3	0 0	11	6 0	29 6	162 5	17	0 0	5 1	48
East North Central	5 0	0 0		0 6	11	6 8	19 2	76 1	28	0 0	1 2	121
West North Central	15 9	0 0		0 0	4	4 0	37 8	77 6	30	0 0	8 0	107
South Atlantic	3 3	0 0	8 2	0 0	5	9 8	32 7	93 2	41	0 0	1 6	142
East South Central	5 9	0 0		0 0	0	5 9	47 2	17 7	18	0 0	23 6	6
West South Central	25 8	0 0	5 7	2 9	9	0 0	48 8	17 2	6	0 0	34 4	9
Mountain	31 8	15 9	7 9	0 0	0	15 9	55 6	23 8	87	0 0	7 9	246
Pacific	6 5	0 0	3 3	0 0	104	9 8	32 6	3 3	62	0 0	0 0	13
Total	7 2	0 3	2 2	0 3	15	6 3	31 3	97 2	30	0 0	5 8	82

PLAGUE INFECTION IN SAN LUIS OBISPO COUNTY, CALIF.

Plague infection has been reported proved in San Luis Obispo County, Calif., in a pool of 400 fleas from 25 ground squirrels, *C. beecheyi*, submitted to the laboratory on August 28 from a ranch 4 miles north of Alamo Creek Bridge and Highway No. 166, and in a pool of 200 fleas from 40 ground squirrels, same species, submitted to the laboratory on August 23 from a ranch 2 miles east of San Luis Obispo and proved positive for plague on September 12.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found on August 19, 1944, in the Hamakua Mill area, Honokaa, Hamakua District, Island of Hawaii, T. H., was proved positive for plague on August 24, 1944. Plague was also proved positive on August 20, 1944, in a pool of 8 mice found on August 15, 1944, in Paauhau area, Honokaa, Hamakua District, Island of Hawaii, T. H. A rat found in the same location on August 22, 1944, was proved positive for plague on August 31, 1944.

Puerto Rico

Notifiable diseases - 4 weeks ended September 9, 1944.—During the 4 weeks ended September 9, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Ophthalmia neonatorum	3
Chickenpox	11	Poliomyelitis	1
Diphtheria	51	Syphilis	892
Dysentery	19	Tetanus	2
Filariasis	2	Tetanus infantile	1
German measles	6	Trachoma	1
Gonorrhea	532	Tuberculosis (all forms)	608
Influenza	13	Typhoid fever	44
Malaria	712	Typhus fever (endemic)	14
Measles	40	Undulant fever	1
Mumps	7	Whooping cough	176

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 26, 1944.—During the week ended August 26, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		11	20	8	7	15	12	74
Diphtheria		3		10	1	2			1	17
Dysentery (bacillary)				6					1	7
German measles				3	[illegible]		1	2	5	17
Influenza					10				[illegible]	1
Measles			6	51	32	13	6	7	5	120
Meningitis, meningococcus		1		2						3
Mumps				15	27	1	2	12	3	60
Poliomyelitis		1	10	1	32	7	1	7	1	60
Scarlet fever		1	8	40	45	4	3	11	[illegible]	125
Tuberculosis (all forms)			12	126	50	12			16	216
Typhoid and paratyphoid fever		1	1	28	3		1		3	37
Undulant fever					3		1			4
Whooping cough		21		63	34	3	4	8	32	165

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–June 1944	July 1944	August 1944—week ended 5	12	19	26
ASIA							
Ceylon	C	2					
India	C	113,190	11,909				
Calcutta	C	2,685	178	67	63	54	
Chittagong	C	63					
Madras	C	36					
Negapatam	C	17					
Vizagapatam	C		23	45	138	94	

PLAGUE

[C indicates cases D, deaths P present]

Place		January-June 1944	July 1944	August 1944 week ended 5	12	19	26
AFRICA							
Algeria[1]	C		2				
Belgian Congo	C	2					
Plague infected rats		P					
British East Africa							
Kenya	C	2	4				
Uganda	C	5					
Egypt	C	507	29				
Port Said	C	35	23	4			1
Suez	C	157					
French West Africa Dakar	C	1	94				[2] 141
Madagascar	C	60					
Morocco (French)	C	70	7		2		
Rhodesia northern	C	1					
Senegal	C	2	15		2		
Tunisia	C						1
Union of South Africa	C	23					
ASIA							
China Foochow	C	1					
India	C	[illegible]	8				
Indochina	C		2				
Palestine	C	2	[illegible]	1	2	5	
EUROPE							
Portugal Azores	C	10	3		1		
SOUTH AMERICA							
Bolivia							
Chuquisaca Department	C	4	1				
Tarija Department	C	6	3				
Ecuador Chimborazo Department	C	4					
Peru							
Ancash Department	C						
Lambayeque Department	C	1					
Libertad Department	C						
Lima Department	C	17					
Piura Department	C	2					
OCEANIA							
Hawaii Territory							
Hamakua District	D	1	1				
Plague infected rats[4]		[5] 12	3	1		1	[7] 1

[1] For the week ended Sept 9 1944 1 case of plague was reported in Algiers, Algeria
[2] For 4 weeks ended Aug 26 1944
[3] Includes 1 death from pneumonic plague
[4] 53 fleas were also proved positive for plague on Mar 7 1944
[5] Includes 12 plague infected mice
[6] Plague infected mouse
[7] Also plague infected tissue in a pool of 8 mice

SMALLPOX

[C indicates cases D deaths P present]

AFRICA							
Algeria	C	678	12		12		
Angola	C	24					
Basutoland	C	130					
Belgian Congo	C	1 167	110				
British East Africa							
Kenya	C	2 684	193	16			
Mombasa	C	142	1				
Tanganyika	C	1 704	722			198	
Uganda	C	2 404	543	102	114		
Cameroon (French)	C	348	17				
Dahomey	C	[illegible]	1		11		
Egypt	C	10 458	274	50		22	
French Equatorial Africa	C	1 041					
French Guinea	C	808	54		13		
French West Africa	C	105	4		6		
Gambia	C	13					
Gold Coast	C	6					
Ivory Coast	C	390	13				

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		January–June 1944	July 1944	August 1944—week ended— 5	12	19	26
AFRICA—continued							
Mauritania	C	1					
Morocco (French)	C	620	28				
Mozambique	C	1	1				
Nigeria	C	3,095	216	31			
Niger Territory	C	541	9				
Senegal	C	147	15		2		
Sierra Leone	C	393					
Sudan (Anglo-Egyptian)	D	1					
Sudan (French)	C	1,865	18		3		
Tunisia	C	6					
Union of South Africa	C	135	31				
ASIA							
Arabia	C	[1] 9					
Ceylon	C	8					
China: Kunming (Yunnan Fu)	C	44	9				
India	C	201,821	10,364				
Indochina	C	1,517	40				
Iran	C	789					
Iraq	C	31	1				
Palestine	C	143	10	8		1	
Syria and Lebanon	C	176					
EUROPE							
France	C	1					
Gibraltar	C	P					
Great Britain	C	[2] 17	1				
Greece	C	317					
Italy	C	275	240	22		21	11
Portugal	C	28	2	1			
Spain	C	147					
Turkey	C	5,550					
NORTH AMERICA							
Dominican Republic	C	1					
Guatemala	C	4	3				
Honduras	C	9					
Mexico	C	1,695					
SOUTH AMERICA							
Bolivia	C	372	103				
Brazil	C	115	187				[3] 273
Colombia	C	278	36	9	7	5	6
Ecuador	C	5					
Peru	C	203					
Lima	C	19					
Venezuela	C	190	41				

[1] Includes 4 imported cases.
[2] Includes 1 case imported from the Middle East.
[3] For the month of August 1944.

TYPHUS FEVER

[C indicates cases]

AFRICA							
Algeria	C	851	80		8		
Basutoland	C	4					
Belgian Congo	C	10					
British East Africa: Kenya	C	7					
Egypt	C	15,886	618	124		99	
French Guinea	C	2					
French West Africa: Dakar	C	22					
Gold Coast	C	5					
Morocco (French)	C	2,010	320				
Morocco (Spanish)	C	6					
Mozambique	C	2					
Nigeria	C	2					
Rhodesia, northern	C	40	22		3		
Sierra Leone	C	30					
Sudan (Anglo-Egyptian)	C		2				
Tunisia	C	578	34		3		
Union of South Africa	C	4,723	37				

TYPHUS FEVER—Continued

[C indicates cases]

Place		January–June 1944	July 1944	August 1944 week ended— 5	12	19	26
ASIA							
Arabia: Western Aden Protectorate	C	[1] 15					
Ceylon	C	1					
China: Kunming (Yunnan Fu)	C	48	16	3	4		6
India	C	6					
Indochina	C	975	29				
Iran	C	6,310	18				
Iraq	C	542	8				
Palestine	C	391	19			10	4
Syria and Lebanon	C	422	5				
Trans-Jordan	C	29					
EUROPE							
Belgium	C	9	1				
Bulgaria	C	624					
France	C	8					
Greece	C	269					
Hungary	C	2,837	276		[2] 75	25	12
Irish Free State	C	6	1				
Netherlands	C	8					
Norway	C	1					
Portugal	C	4					
Rumania	C	6,000					
Slovakia	C	316	15				
Spain	C	401					
Turkey	C	2,076					
Yugoslavia	C	6,264	713				
NORTH AMERICA [3]							
Costa Rica	C	2					
Dominican Republic	C	10					
Guatemala	C	1,370	175				
Jamaica	C	41	4	1	4	2	2
Mexico	C	1,055					
Panama Canal Zone	C	1					
Puerto Rico (endemic)	C	92	37	15	8	3	5
Salvador	C	4					
Virgin Islands	C	2	4				
SOUTH AMERICA							
Bolivia	C	108	58				
Brazil	C	2		2			
Chile	C	302		[4] 39			
Colombia	C	250					
Curacao	C	1	1				1
Ecuador	C	188					
Peru	C	474					
Venezuela	C	46	14				
OCEANIA							
Australia	C	128	14	1	2	1	
Hawaii Territory	C	34	8		1	1	3

[1] A report dated Mar. 30, 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia.
[2] For 2 weeks.
[3] Cases of typhus fever listed in this area are probably of endemic type.
[4] For the period July 16–Aug. 12, 1944.

YELLOW FEVER

[C indicates cases, D, deaths]

Place		January–June 1944	July 1944	August 1944—week ended—			
				5	12	19	26
AFRICA							
Belgian Congo							
Babeyru	D	1					
Banzyville	C	1	1		[1] 1	[1] 10	
Bondo	D	1					
Leopoldville	C	1					
Gold Coast							
Kintampo	C	[1] 1					
Sekondi	C			[1] 1			
Tamale	C	[1] 1					
Yendi	C		[1] 1				
Ivory Coast Abidjan	C				1		
Portuguese Guinea Port Bintam	C		1				
EUROPE							
Portugal Lisbon [2]							
SOUTH AMERICA							
Bolivia							
La Paz Department	C	1					
Santa Cruz Department	C	3					
Brazil							
Acre Territory	D	1					
Matto Grosso State	D	3					
Para State	D	2					
Colombia							
Boyaca Department	D	2					
Caldas Department	D	1					
Cundinamarca Department	D	1					
Santander Department	D	4					
Venezuela [3]							

[1] Suspected

[2] According to information dated Jan 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board

[3] For the week ended Sept 2, 1944, 3 deaths from yellow fever were reported near San Camilo, Apure State, Venezuela

COURT DECISION ON PUBLIC HEALTH

Milk ordinance recommended by Public Health Service—incorporation by reference in local board of health regulation.—(Ohio Supreme Court; *State* v. *Waller*, 55 N. E. 2d 654; decided June 7, 1944.) The district board of health of Butler County adopted a regulation which provided, among other things, that the sale of milk and milk products should be regulated in accordance with the terms of the unabridged form of the 1939 edition of the United States Public Health Service milk ordinance. The publication of the regulation did not contain the milk ordinance referred to but a certified copy of such ordinance was to be on file in the office of the board of health. The defendant was convicted of violating the regulation of the district board of health in that he sold milk without a permit from the county health officer. The judgment of conviction was affirmed by the court of common pleas but reversed by the county court of appeals, and, from the latter court's judgment, the State appealed to the Supreme Court of Ohio. The supreme court said that the question presented could be stated as follows: "Where a district board of health adopts a regulation and by reference incorporates into such regulation the text of a recommended ordinance

found in a bulletin issued by the United States Public Health Service and advertises the regulation in short form, as adopted, has such regulation been legally adopted and advertised?"

Section 1261-42 of the Ohio General Code provided in part that the board of health of a general health district could make such orders and regulations as it deemed necessary for the public health, the prevention or restriction of disease, and the prevention, abatement, or suppression of nuisances. Such section further provided: "All orders and regulations not for the government of the board, but intended for the general public, shall be adopted, recorded, and certified as are ordinances of municipalities and record thereof shall be given in all courts of the State the same force and effect as is given such ordinances, but the advertisements of such orders and regulations shall be by publication in one newspaper published and of general circulation within the general health district." The supreme court pointed out that reference statutes were in general use throughout the country and that the Ohio Legislature had followed the practice but had, in most instances, limited the incorporation by reference to other sections of the code The language of a prior case was quoted wherein it was stated that "The effectiveness of legislation by reference has been so generally recognized in Ohio that no very specific declaration appears in the reported cases." Proceeding to the matter of local regulations, the court cited section 4226 of the General Code in which it was stated in part that "No by-law or ordinance, or section thereof, shall be revived or amended unless the new by-law or ordinance contains the entire by-law or ordinance, or section revived or amended, and the by-law or ordinance, section or sections so amended shall be repealed." So long as there was no violation of this section, the court said that it saw no objection to the incorporation by reference in a regulation of a district board of health of a duly enacted statute or a duly enacted ordinance which had been theretofore properly published. However, the supreme court was of the view that a publication of a district board of health regulation which omitted the rules of conduct to be observed and merely referred those who might be affected to a copy of the terms "on file in the office of the board of health" was not a compliance with section 1261-42 of the code and that, until proper publication had been made, such regulation was not effective and no prosecution could be had thereunder.

The judgment of the court of appeals, which reversed the judgment of the court of common pleas and discharged the defendant, was affirmed.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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AN EPIDEMIC OF A SEVERE PNEUMONITIS IN THE BAYOU REGION OF LOUISIANA [1]

By B. J. Olson, *Surgeon, United States Public Health Service*, and W. L. Treuting, *Director, Division of Preventive Medicine, Louisiana State Department of Health*

I. EPIDEMIOLOGICAL STUDY

This report concerns an epidemic of a severe pneumonitis which occurred in 6 scattered parishes of Louisiana over a total area of approximately 20,000 square miles. The disease was recognized as an entity only after an epidemiological study of 3 cases was begun on March 8, 1943. This particular variety of pneumonitis was unusual in that it spread among nursing contacts of cases and had a high mortality—8 deaths in 19 recognized cases.

The initial case was the wife of a trapper living 3 miles east of Creole on the Little Chenier, Cameron Parish (figs. 1 and 2). On December 4, 1942, this individual (case 1) developed an acute febrile illness at her home, became progressively worse, and was transferred to a sanatorium in Ville Platte, La., 120 miles northeast of Creole, where she expired on December 18, 1942. One nurse who had attended her became ill with a similar acute illness on December 24, 1942, and died on January 6, 1943 (case 2). The husband of case 1, who had remained in close attendance during her illness, returned to his home, where he became ill on December 24, 1942 (case 3), and died on January 26, 1943. An elderly man who was hospitalized in the sanatorium in a room adjacent to that occupied by case 1 developed a pneumonitis after leaving the sanatorium and recovered after a severe illness of long duration (case 4).

Case 2 was treated in the sanatorium and gave rise to six secondary cases of the disease in nurses or in individuals who acted as nurses during her illness (cases 5, 6, 7, 8, 9, 10). Of this series, cases 7 and 8 were treated in the sanatorium; cases 5, 6, and 9 in their homes

[1] From the Division of Infectious Diseases, National Institute of Health, and the Louisiana State Department of Health

[2] Presented to the Louisiana State Medical Society, April 25, 1944.

at Ville Platte; case 10, in her home at Bunkie, Avoyelles Parish, La. Only case 5 was fatal and gave rise to four secondary cases (cases 11, 12, 13, and 14). These individuals were treated in their homes at Ville Platte. Case 13 proved fatal and gave rise to a secondary case in his son (case 15) who had attended him at Ville Platte during his fatal illness, returned to his home in Rayne, Acadia Parish, La., became ill with the disease, and died. He was the source of secondary cases in his wife (case 16) and two nurses (cases 17 and 18). The latter had returned to their homes at New Iberia, Iberia Parish, before they became ill, and died there. Rigorous control measures were introduced

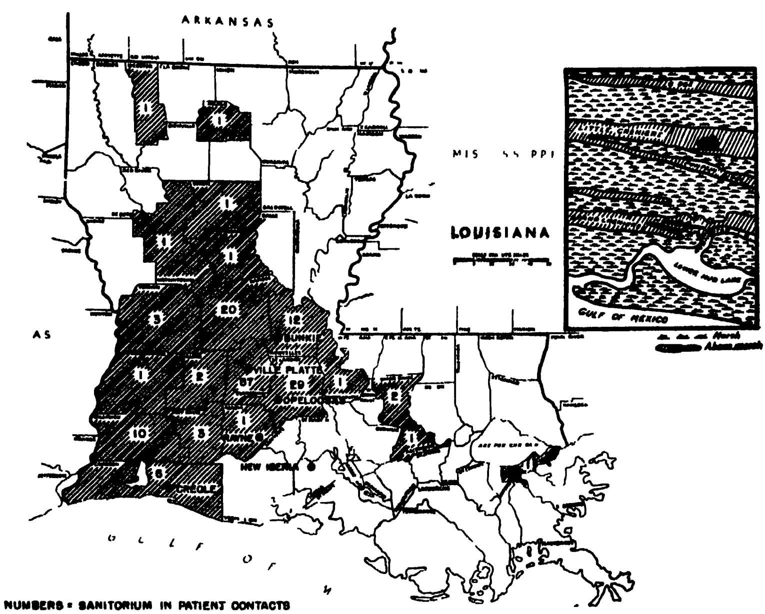

FIGURE 1. Area of study

about cases 17 and 18, and except for one attending nurse (case 19) who developed the disease while she was still in quarantine, no further spread occurred.

The foregoing sequence of events is portrayed in figure 2; the geographical location in figure 1. It is worth noting here that a single case of the disease gave rise to 18 additional cases scattered over 6 different parishes of the State.

DIAGNOSIS

Because of the wide geographical distribution of cases, 13 physicians saw and treated the 19 cases. Their diagnoses were lobar pneumonia, influenzal pneumonia, bronchopneumonia, virus pneumonia, or atypical virus pneumonia. The clinical course of the

disease was such that all attending physicians recognized that they were dealing with a type of pneumonitis that they had not previously encountered. The authors personally studied cases 16, 17, 18, and 19 in the series. The physicians caring for cases 1, 2, 7, and 8 in the sanatorium were of the opinion that they were similar. Dr. Arthur Vidrine, former Dean of Louisiana State University Medical Center,

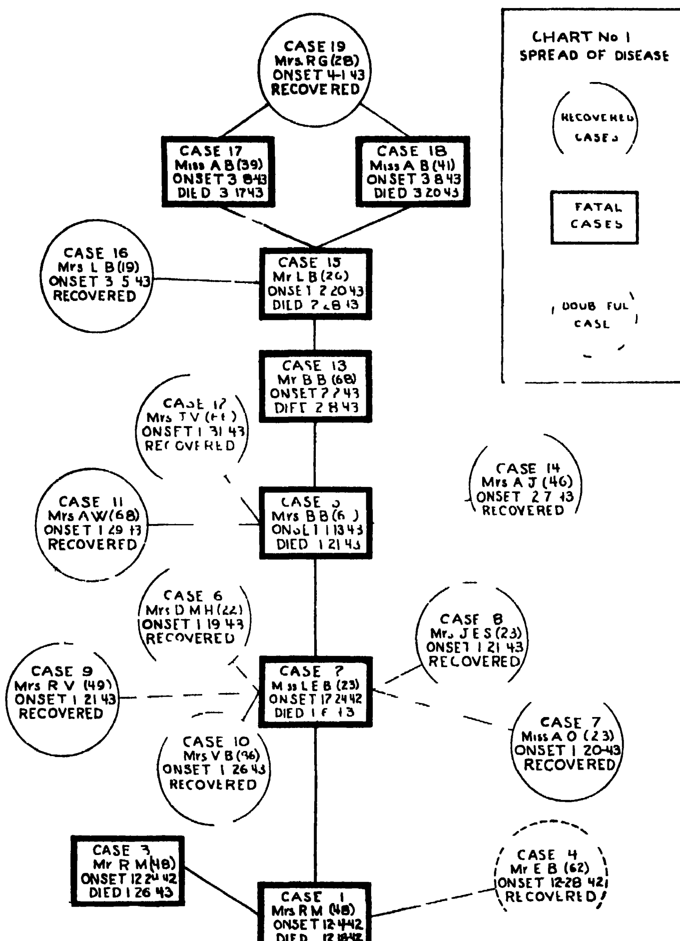

FIGURE 2.—Spread of the disease.

who attended cases 5, 6, 11, 12, 13, and 14 in Ville Platte, also saw cases 17 and 18 in New Iberia, as a consultant, at the end of the epidemic. He concurs in the opinion that the cases represent the same clinical disease. With the exception of case 16, all cases in the series were severe, varying only in ultimate outcome. A description of the clinical features of individual cases is given in the following article (*1*).

Spread of the disease.—The disease spread only to those attending

fatal cases. There was no spread from a nonfatal case, and in only one instance was there no spread from a fatal case (case 3). (See fig. 2 and table 1).

It was not possible to account for the total number of individuals exposed except in cases 17, 18, and 19. This is due to the custom of the people of this region—when an individual becomes ill, the immediate family, relatives, neighbors, and friends come to visit and help care for him. All of the cases were in white people of French ancestry in comfortable circumstances, and distance of travel was not a matter of concern, as is evident from the subsequent distribution of disease. Furthermore, the dangerous character of the disease, which was quickly realized by the lay attendants, was no deterrent As a result it was possible to determine accurately only the number of people with intimate and prolonged exposure to a given case and not the total number of people exposed Table 1 gives the number

TABLE 1 —*Summary by cases*

Case No	Source of infection	Place of infection	Place of illness	Outcome	Number of known intimate contacts	Number of secondary cases
1	Unknown	Little Chenier	Ville Platte [1]	Fatal	12	3
2	Case 1	Ville Platte [1]	do [1]	do	14	6
3	do	do [1]	Little Chenier	do	3	0
5	Case 2	do	Ville Platte	do	7	4
13	Case 5	do [1]	do	do	5	1
15	Case 13	do	Rayne	do	7	3
17	Case 15	Rayne	New Iberia	do	8	([2]) 1
18	do	do	do	do	8	([2]) 1
14	Case 5	Ville Platte	Ville Platte	Recovered	3	0
6	Case 2	do [1]	do	do	6	0
7	do	do [1]	do [1]	do	12	0
8	do	do [1]	do [1]	do	12	0
9	do	do [1]	Ville Platte	do	4	0
10	do	do [1]	Near Bunkie	do	4	0
11	Case 5	do	Ville Platte	do	5	0
12	do	do	do	do	7	0
4	Case 1	do [1]	Near Opelousas	do	4	0
16	Case 15	Rayne	Rayne	do	2	0
19	Cases 17 and 18	New Iberia	New Iberia	do	5	0

[1] Ville Platte sanatorium
[2] Same individual

of people known to have had intimate contact with a case and who were in close attendance This is not to be considered the total number exposed except in cases 17, 18, and 19.

A. Nursing attendants:

The spread of the disease to nursing attendants of fatal cases is best exemplified by case 2. Miss B., a staff nurse of the sanatorium, attended case 1 from December 12 until December 18. She remained on duty at the sanatorium until admission as a patient on the evening of December 26, with a temperature of 100° F., complaining of having felt ill since December 24, which is considered the date of onset. She was attended during her illness by eight staff nurses, one special nurse, two physicians, her mother, brother, and a friend. She occu-

pied a private room until her death on January 6. One nurse (Mrs. S.) was in attendance the fourth night and for the last 9 nights of her illness, the longest continuous exposure of any nurse. Mrs. S. developed the disease, becoming case 8.

Mrs. H., a special nurse for case 2, was in attendance only on the night before her death. She had not nursed in the hospital for the previous month. She developed the disease (case 6) after that single short exposure.

Miss O., a staff nurse, attended case 2 at intervals for the last 4 days of illness and developed the disease (case 7).

Mrs. V., a close friend of case 2, was in the room with her at intervals during her illness and was present the day and evening of death She developed the disease (case 9).

Mrs. B. was on duty as a special nurse attending another case in the hospital but, being a friend of case 2, visited throughout the illness and assisted in nursing at short intervals. She developed the disease and became case 10.

Her mother, who attended her throughout her illness, developed the disease, becoming case 5 in the series. Two nurses and the brother of case 2 had as much or more exposure than Mrs. H. (case 6) and definitely more exposure than Mrs. B. (case 10), but they did not develop the desease.

This 1 fatal case gave rise to secondary cases in 6 of 14 close attendants. The only significant factor common to all of those who contracted the disease was their close attendance at some time during the 48 hours prior to the patient's death. The condition and degree of exposure did not vary significantly between those who developed the disease and those who escaped. The shortest time of exposure of any attendant was that of Mrs. H. (case 6), which was only during the night prior to the death of case 2, yet she contracted the disease.

The lack of spread of the disease to close attendants of nonfatal cases cannot be explained.

B. Ville Platte Sanatorium:

The sanatorium is located in the town of Ville Platte which has a population of 3,721 (1940). It is a new one-story building situated on the main street, well constructed, and so designed, because of the hot summers, as to give a maximum cross ventilation to all rooms. There are 34 rooms for in-patients, of which 30 are private. On the date of admission of case 1, only 12 patients were in the hospital, and none of these had pneumonia, nor were there cases of pneumonia among the sanatorium staff.

The population of this sanatorium was considered to be exposed from the date of admission of case 1, on December 12, 1942, until the last case treated in the sanatorium became afebrile on February 26, 1943. The total number of people possibly exposed in the sanatorium

to cases of this pneumonitis could not be determined. The main waiting room for out-patient clinics is adjacent to the in-patient rooms and opens into the same corridors. Individuals attending out-patient clinics were therefore conceivably exposed. No accurate listing of the out-patients was available. Their exposure was probably less than the in-patients, for whom there was an accurate record available, and this group was studied for a possible spread of the disease. An immediate attempt was made to trace all of these individuals (totaling 202) through their respective State, city, and county health departments. All of those found were placed under observation for a minimum of 21 days after they had left the sanatorium.

Contacts from Ville Platte sanatorium

CONTACTS

State to which contact returned	Number located Mar 12 Apr 3, 1943	Number located Apr 4 May 14, 1943	Number not located	Total
Louisiana	105	17	62	184
Texas	12	2	3	17
Alabama	1	0	0	1
Total	118	19	65	202

There was a total of 184 Louisiana contacts from the sanatorium, who had returned to 20 of the 64 parishes in the State. Their distribution is given in figure 1, from which it will be noted they had spread throughout the State except for the northeast and southeast corners. A total of 122 (66 percent) were located and checked for illness One case of pneumonitis developed in this group of patients and was discovered by this procedure (case 4). There were no cases of pneumonitis in the contacts located in Texas or Alabama.

Case 4 occupied a room adjacent to that of case 1, leaving the hospital the day of the death of case 1. Eight days later he developed a severe pneumonitis similar in onset, clinical course, and lack of response to therapy to the cases under study, but dissimilar in physical findings. He had no direct exposure to case 1 but was attended by the same staff nurses. It is doubtful that case 4 should be considered a case in this epidemic.

C. General population:

Owing to the fact that the total number of contacts of cases could not be determined, it was necessary to establish a close surveillance of the towns where cases occurred, and also of large rural areas. This was done through the local health departments and physicians. A number of suspicious cases were brought to the attention of the authors but proved not to be the pneumonitis under study. In several instances of unexplained fatal disease, autopsy material was studied.

PERIOD OF COMMUNICABILITY

The disease spread among attendants of fatal cases only, and only to those who were in attendance within 48 hours of the death.

There were two instances of individuals working during their first day of illness (both ultimately expired) in quite close contact with many other people, but there was no spread of the disease to these contacts.

Case 15 was of unique interest because of his activities on the first day of illness. Despite his illness on the morning of February 20, he worked that day as a wholesale salesman with his brother, returning to his home in the evening with a temperature of 104° F. They visited stores throughout Acadia Parish, spending from 10 minutes to an hour in close contact with store owners. His itinerary was obtained, and it was found he had visited 11 stores in 4 towns of the parish, where he was in direct contact with a minimum of 14 people. These individuals as well as the 32 other members of their households were placed under close observation for a period of 3 weeks after exposure, and none developed the disease. However, of the 7 people aiding in his care during the 48 hours prior to death, 3 contracted the disease and only 1 recovered.

Case 18 worked as a special nurse the first day of her illness, but neither her patient nor nursing colleagues with whom she was in contact developed the disease. There were other similar instances of nonfatal cases working the first day of illness with no spread to their contacts.

The infectiousness of cases late in the disease may be related to the fact that a productive cough developed only aft the disease was well established. However, the productive cough occurred in both nonfatal and fatal cases, and only the latter gave rise to secondary cases. The virus causing the disease was demonstrated in the throat washings of nonfatal case 16 on the ninth day of illness and in fatal case 17 on the third day—evidence that both types of cases are demonstrably infective at an early stage (*2*). No evidence was found of mild clinical illness which might represent mild forms of the disease. In those who had known contact with a case and were brought under close daily observation, there was a remarkable absence of any illness in those either directly or indirectly exposed. The possibility of subclinical infections occurring in contacts cannot be excluded. Serum was obtained from individuals who had varying degrees of exposure, but as yet no satisfactory serological measure of infection has been developed.

The degree of exposure necessary to contract the disease cannot be stated. All of the secondary cases had a heavy exposure but not necessarily a prolonged one, as was described in case 2. A number

of people were heavily exposed and did not contract the disease. No attending physician contracted the disease nor did the undertakers concerned, one of whom embalmed three bodies.

It is probable that intimate contact with a fatal case in the last 48 hours of illness is necessary to contract the disease.

INCUBATION PERIOD

The incubation period was determined in the following manner: The shortest possible period of incubation—the time interval between the date of death of a case and the date of onset of illness of the secondary case; the longest possible period of incubation— the time interval between the date of first contact with a case and the date of onset of illness. These data are given in the following table.

Incubation period

Case No	Shortest number of days	Longest number of days	Case No	Shortest number of days	Longest number of days
1					16
2					18
3					18
4					25
5					18
6					13
7					12
8					12
9					22
10					

The shortest period of incubation ranged from 6 to 19 days, with an average of 10 days; the longest period, from 12 to 30 days, with an average of 19 days. It will be noted that the longest possible incubation period is more variable than the shortest possible period. This again suggests that a case is more infectious late in the disease. One case is of particular interest—case 6 had only a single exposure and therefore could only have the incubation period given.

In this series of cases that the incubation period would appear to be from 6 to 19 days is most likely

AGE AND SEX DISTRIBUTION

Both the age and sex distribution were doubtless influenced by the fact that only those in close attendance, in a nursing capacity, on fatal cases, late in their illness contracted the disease. Children present in the homes of fatal cases did not have this type of contact nor did men in most instances. The influence of sex on mortality in this series is odd, in that of the 15 cases in females only 5 died, whereas of the 3 certain cases in males, all died. If case 4 is included, 3 out of 4 cases in males died. There was nothing to indicate a

Age and sex distribution

Age	Male	Female	Total	Age	Male	Female
19	0	1	1	50-59	0	0
20-29	1	5	6	60-69	2	2
30-39	0	2	2			
40-49	1	5	6	Total	4	15

greater degree of exposure of the men infected; rather, the heaviest exposures were incurred by women. Age did not appear to influence the outcome of a case. Death occurred in each of the decades in which cases occurred with the exception of the second decade of life.

MODE OF TRANSMISSION

The transmission of the disease was, with one possible exception (case 4), through direct contact with a previous case of pneumonitis. Careful investigation failed to reveal any psittacine bird in either the sanatorium or homes of any of the cases. There was no food or water supply common to all cases. No evidence could be found of an intermediate insect vector. The most reasonable explanation is that the disease spread by direct contact from case to case, probably by the respiratory route.

The possible existence of human carriers of the disease or mild cases was studied in detail. No evidence could be found of their existence. A careful study of individuals with a known heavy exposure and of their associates revealed a surprising lack, for that season of the year, of even colds or mild upper respiratory disease Particular attention was given this point because of the wide dissemination of contacts.

ETIOLOGICAL AGENT

The etiological agent was isolated from three cases, namely, 16, 17, and 18, and is described in a later article (*2*).

ORIGIN OF THE EPIDEMIC

The initial case lived in a well-constructed and well-maintained farm home 3 miles east of Creole on the Little Chenier in the very isolated coastal marshes. She had not been away from this region for a month preceding her illness, which began during the trapping season when she helped her husband pelt animals, chiefly muskrats. Her husband, later case 3, was well known for his ability as a marsh man, trapper, and hunter. It will be noted from figure 1 that the home is literally surrounded by deep marshes which characterize this region. Investigation revealed no known pneumonias in the region of the Little Chenier at the time of onset of case 1. A study of this

region for a possible reservoir of disease was made, with the assistance of the Chief Biologist, Dr. James N. Gowanloch, and Special Biologist Ted O'Neill, of the State Department of Conservation of Louisiana. This was sharply limited for reasons that are apparent in the following description of the region by Dr. Gowanloch:

> The coastal marshes of Louisiana provide a biological picture of extraordinary complexity. Known locally as "Trembling prairie" (Prairie tremblant), they are the habitation of abundant flora and fauna that live in constantly changing configurations responding to constantly changing conditions. Such a marsh never maintains in a natural state month-to-month stability, since changes of water level and, in the coastal regions, changes of storm overwash may suddenly alter the environment.
>
> Above this marshland rise the Chenieres, so named because of the unusual presence on them of live oak trees. The Chenieres are really old ocean beaches that have become stranded in the marsh and form the long shell ridges that rise like islands above the surrounding green area of marsh vegetation. Below the surface of that green sea live concealed biological communities probably nowhere excelled in intricate variety, communities that have never yet received adequate and deserved scientific investigation.

The biology of this region is further complicated by its being the winter home of varieties of northern and Arctic birds, and in the center of one of the great "fly ways" for migratory birds moving to and from South America. It is literally a "biological crossroads" of the Western Hemisphere, besides having its own rich, largely unstudied fauna and flora (*3*, *4*, *5*, *6*, *7*).

The only known epizootic in the area occurred in muskrats in the large marsh northwest of the home of case 1 a few months prior to her illness. The cause of the epizootic was not known, although it is known that the muskrats were heavily infested with mites.

The susceptibility of muskrats to the virus isolated from the pneumonitis cases was investigated. It did not produce a fatal disease in muskrats, so probably did not cause the epizootic (*8*). A survey of the occurrence of pneumonitis in trappers throughout the coastal marsh region revealed no further cases of the disease. It should be emphasized, however, that because of the nature of the region, the possibility of an animal reservoir has not been thoroughly explored.

PREVIOUS EPIDEMIC OF POSSIBLY THE SAME DISEASE

In the course of the epidemiological investigation it was discovered that a somewhat similar epidemic had occurred in Rayne, La., in February and March 1936, without particular recognition, probably because of the distribution of cases. The physician caring for the initial cases, two nurses who had the disease, family members, and other physicians attending cases were located and interviewed and the following information obtained:

Mrs. P., the initial case, a clerk in a local store, became ill with pneumonitis in her right lung, was admitted to a hospital, and died 7 days later. Following her death, three nurses developed the disease and died. An uncle, who aided in the care of a fatal case in a nurse, developed the disease and died. A patient in the adjoining room to the initial case contracted the disease and died. Two nurses contracted it and recovered. All cases started with a high fever, pneumonitis, usually on the right side, followed by extension of the pneumonia to other areas of the lungs, rapid respiration, cyanosis, and little or no cough. The local medical opinion at the time was that they were cases of influenzal pneumonia.

The origin of this epidemic is not known. Nor is it known if the initial case had been in the area of the coastal marshes, but it is possible, as this is a favorite place for week-end trips, fishing, and hunting. This cannot be proved to be an epidemic of the same disease, but it has a certain similarity. Further study of the serums obtained from the two recovered cases, if successful, should yield valuable information.

CONTROL MEASURES INSTITUTED

The problem of control was particularly difficult because the nature of the disease was unknown. First, a rigorous quarantine of case 16 was established. Cases 17 and 18 were discovered the same day and quarantined.

The measures used in this quarantine are best described by a review of cases 17 and 18, who shared a duplex house during their illnesses and were attended by volunteers consisting of three family members and two nurses who were confined to the house for the duration of illness and for 21 days thereafter. The usual isolation techniques were used in handling each case. All attendants were furnished with the type of mask described by Dr. Wu Lien-Teh for use in pneumonic plague (*9*). (This was done at the suggestion of Medical Director C. L. Williams.)

The masks were made according to original specifications and donated for use by the New Iberia Red Cross Chapter. Because of the lack of space and the arrangement of the house, well-isolated sleeping quarters could not be provided for the nurses and attendants when they were off duty. The masks were worn only when the attendants were on duty and not when they slept. A nurse, Mrs. G. (case 19), became ill while she was in quarantine on the twelfth day after the death of case 18. For the first 3 days of her illness she was attended by the four people remaining in the house, only one of whom, Miss H., was a nurse. It was then possible to segregate the single case on the second floor and use the first floor as living quarters

for the attendants. However, it was felt by both the attending physicians and the community of New Iberia that these individuals had assumed more than their share of risk. The community of New Iberia made available an isolated house outside the city as a place of residence for the three lay attendants; they remained there for 21 days after their last exposure. Miss H. volunteered to remain in attendance on case 19. Two additional nurses from New Orleans volunteered to aid in the care of this case.

Similar measures were used in handling case 16.

All control and investigative procedures were greatly facilitated by an aroused public feeling of spontaneous origin, which proved to be of great value. It stimulated immediate reporting of all known or even suspected illness in the community and resulted in the great effort made to aid in all ways those individuals held in quarantine.

CONCLUSIONS

A virulent pneumonitis, occurring in the bayou region of Louisiana, is characterized by being infectious to nursing attendants late in the illness of fatal cases.

It is spread by direct contact, probably by the respiratory route.

Human carriers of the disease could not be demonstrated.

Source of infection of the original case was not determined.

The causative agent was isolated from two fatal cases and one nonfatal case.

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Acknowledgement is also made of the assistance given by the New Iberia Chapter of the American Red Cross for their contribution to the welfare of cases and contacts and for their manufacture of all masks used; of the assistance and support of the Iberia Parish police jury, the New Iberia city council, and the Rayne town council above and beyond official duty; and of the support in every way of Right Reverend Monsignor J. M. Bourgeois, of Ville Platte, La., and Very Reverend Monsignor H. A. Lerschen, of Rayne, La., which was of inestimable value.

Finally, we pay tribute to the nurses who attended the cases for their unswerving devotion to duty after the dangers of the disease were well established; Public Health Nurse Katherine Avery, R. N., of the Iberia Parish Health Unit, Mrs. R. Gerhart, R. N. (case 19), and Miss H. Hobart, R. N., all of New Iberia; Miss I. Chatelaine, R. N., and Miss R. Speyrer, R. N., of New Orleans; and the staff nurses of the Ville Platte sanatorium. Miss A. Bourgeois and Miss A. Bonin, both victims of this disease, knowingly braved its perils.

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STUDIES ON THE DURATION OF DISABLING SICKNESS

VI. Time Lost from Short-term Absences and Its Relation to Total Time Lost [1]

By W. M. Gafafer, *Principal Statistician*, and Rosedith Sitgreaves, *Junior Statistician, United States Public Health Service*

The short-term absence of less than 4 days was the subject of the fifth paper of the present series, the investigation concerning itself principally with the frequency of such absences and its relation to the total frequency. Based on a 10-year disability experience of male public utility workers it was shown that high total frequencies regularly occurring in the first quarter of each year were associated with relatively small proportions of short-term absences, the proportion tending to become smaller in epidemic periods; on the other hand the low total frequencies generally appearing in the third quarter included relatively large proportions of such absences. Appropriate scatter diagrams for all sickness and the respiratory diseases gave graphic evidence, in general, of an inverse association between the magnitude of the total frequency and the proportion of short-term absences.

[1] From the Industrial Hygiene Division, Bureau of State Services. For earlier papers in the series see list of references.

The question immediately arises of the behavior of time lost from short-term absences and its relation to total time lost. Accordingly it is purposed in this paper, the sixth of the series, to examine further the 10-year disability experience of the public utility workers with particular reference to the ratio of time lost from short-term absences beginning in a specified quarter-year to time lost from all sick absences beginning in that quarter. Consideration will be given to the variation of the ratio with time for specific quarter-years, and to a possible correlation between the value of the ratio and the magnitude of the total time lost rate.

With regard to causes of sickness, attention will be directed to all sickness, and to both the respiratory and nonrespiratory groups of diseases. Although the preceding paper on frequency was limited to a consideration of all sickness and the respiratory group, the relatively large contribution of the nonrespiratory diseases to time lost makes imperative the inclusion of this group in the present investigation. Thus, while less than 40 percent of the sick absences recorded for the public utility workers during the 10-year period were accounted for by nonrespiratory illness, these absences caused almost 60 percent of the total time lost.

The supporting data [2] represent days lost from recorded disabilities due to sickness beginning during the years 1933–42, inclusive, the days attributed to any absence being the number of calendar days from the date absence began to the date absence ended, or to the 372d day, inclusive. During the 10-year period approximately 26,000 male-years of exposure yielded 22,704 sick absences of 1 calendar day or longer; of these 12,846, or 57 percent, lasted less than 4 days. The number of days of disability arising from all sick absences was 181,914 of which 23,520, or 13 percent, resulted from short-term absences.

TIME LOST FROM SHORT-TERM ABSENCES

Table 1 presents, among other things, the average annual number of days lost per male (or disability rate) yielded by absences of less than 4 days and those of 1 day or longer for all sickness, respiratory diseases, and nonrespiratory diseases, according to quarter-year in which absence began.

An examination of the disability rates for the short-term absences reveals that the rates for all sickness range in value from 0.417 day per male resulting from absences beginning in the third quarter of 1940 to 1.669 days lost from absences beginning in the first quarter of 1939, the mean of the 40 rates being 0.894. The rates for the respiratory diseases vary from 0.177 to 1.309 with a mean of 0.586, while the

[2] The present report constitutes the tenth paper based on data from the public utility company. The earlier papers are given in the list of references.

TABLE 1.—*Ratio of time lost from short-term absences (1–3 calendar days) to time lost from all absences (1 calendar day or longer) due to all sickness, respiratory diseases, and nonrespiratory diseases, according to quarter-year in which absence began, experience of male employees in a public utility, 1933–42, inclusive*

Quarter year in which absence began	All sickness: Average annual number of days lost per male: A Short term absences (1 3 days)	All sickness: Average annual number of days lost per male: B All absences (1 day or longer)	All sickness: Ratio A to B	Respiratory diseases: Average annual number of days lost per male: A′ Short term absences (1 3 days)	Respiratory diseases: Average annual number of days lost per male: B′ All absences (1 day or longer)	Respiratory diseases: Ratio A′ to B′	Nonrespiratory diseases: Average annual number of days lost per male: A″ Short term absences (1 3 days)	Nonrespiratory diseases: Average annual number of days lost per male: B″ All absences (1 day or longer)	Nonrespiratory diseases: Ratio A″ to B″	Average number of males
1933										
First	1 189	12 347	0 10	0 936	8 710	0 11	0 253	3 637	0 07	2 561
Second	509	4 409	12	308	1 081	28	201	3 328	06	2 550
Third	504	3 981	13	246	1 037	24	258	2 944	09	2 568
Fourth	918	7 839	12	643	3 547	18	275	4 292	06	2 579
1934										
First	1 461	7 579	19	1 102	5 466	20	359	2 113	17	2 574
Second	807	6 895	12	406	2 001	20	401	4 894	08	2 560
Third	543	5 017	11	271	1 502	18	2 2	3 515	08	2 551
Fourth	919	6 433	14	604	2 982	20	315	3 451	09	2 544
1935										
First	1 239	10 196	12	940	5 516	17	299	4 680	06	2,546
Second	685	5 913	12	410	2 303	18	275	3 610	08	2 541
Third	486	5 438	09	206	1 104	19	280	4 334	06	2 558
Fourth	910	3 981	23	591	1 957	30	319	2 024	16	2 564
1936										
First	1 293	7 416	17	927	4 387	21	366	3 029	12	2 575
Second	669	6 411	10	375	1 839	20	294	4 572	06	2 598
Third	639	3 099	21	353	921	38	286	2 178	13	2 614
Fourth	883	6 617	13	589	3 300	18	294	3 257	09	2,637
1937										
First	1 347	11 234	12	1 055	7 879	13	292	3 355	09	2 652
Second	652	6 749	10	347	2 427	14	305	4 322	07	2 681
Third	610	4 628	13	261	1 041	25	349	3 587	10	2 698
Fourth	797	6 556	12	460	2 511	18	337	4 045	08	2 724
1938										
First	1 156	7 156	16	800	3 883	21	356	3 273	11	2 778
Second	681	5 324	13	351	1 388	25	330	3 936	08	2 787
Third	545	4 942	11	269	1 281	21	276	3 661	08	2 780
Fourth	1 103	7 202	15	725	3 086	23	378	4 116	09	2 773
1939										
First	1 669	10 826	15	1 309	6 797	19	360	4 029	09	2 758
Second	794	6 870	12	473	2 210	21	321	4 660	07	2 737
Third	673	4 611	15	314	1 068	29	359	3 543	10	2 732
Fourth	1 038	7 576	14	708	2 847	25	330	4 720	07	2,724
1940										
First	1 438	10 081	14	1 058	4 535	23	380	5 546	07	2 713
Second	691	7 265	10	355	1 955	18	336	5 310	06	2 707
Third	417	4 632	09	219	1 000	22	198	3 632	05	2 708
Fourth	759	6 871	11	514	2 606	20	245	4 268	06	2,694
1941										
First	1 448	12 495	12	1 184	8 642	14	264	3 853	07	2 702
Second	580	6 419	09	341	2 452	14	230	4 017	06	2,704
Third	482	4 155	12	177	717	25	305	3 438	09	2 705
Fourth	819	6 452	13	551	2 355	23	268	4 097	07	2,697
1942										
First	1 466	9 556	15	1 127	4 325	26	339	5 231	06	2 652
Second	812	7 166	11	467	1 597	29	345	5 569	06	2 549
Third	792	4 920	16	462	1 543	30	330	3 377	10	2 473
Fourth	1 353	9 205	15	994	3 779	26	359	5 426	07	2,258

nonrespiratory disease rates range from 0.198 to 0.401, the corresponding mean being 0.308.

It is of interest to observe that for short-term absences beginning in the first, second, and fourth quarters of each of the 10 years, and in the third quarters of 1936, 1940, and 1942, the disability rate for the respiratory diseases is consistently higher than the corresponding rate for the nonrespiratory group. On the other hand, for absences of 1 day or longer beginning in the first quarters of 1940 and 1942, and in the second, third, and fourth quarters of each of the 10 years excepting the fourth quarter of 1936, the respiratory disability rate is less than the corresponding rate for the nonrespiratory diseases. On the average the respiratory diseases contribute 65 percent of all

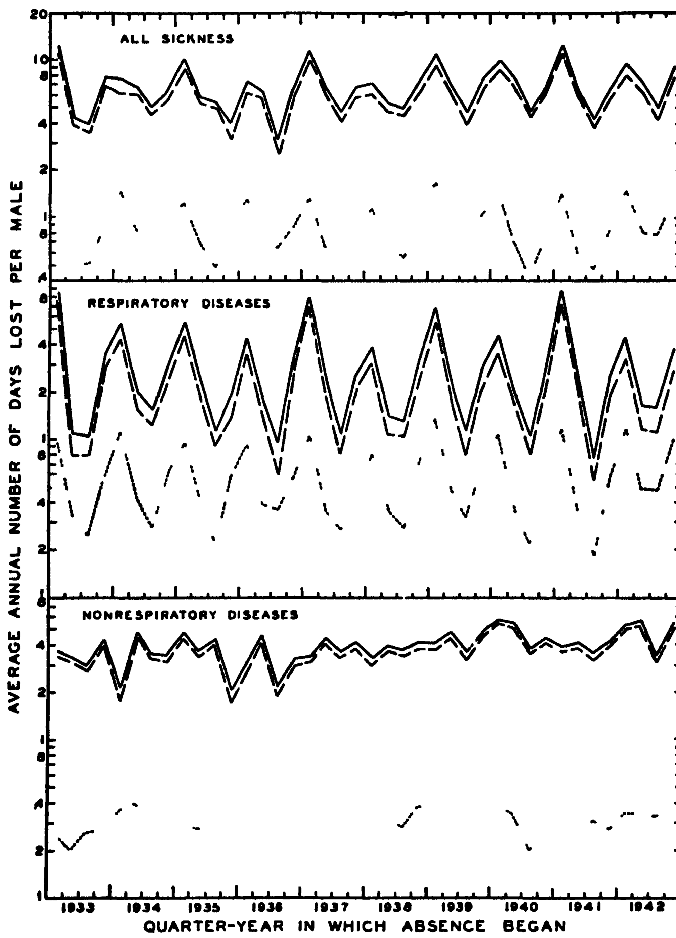

FIGURE 1.—Average annual number of days lost per male from all absences (1 calendar day or longer), short-term absences (1-3 calendar days), and other than short-term absences (4 calendar days or longer) due to (a) all sickness, (b) respiratory diseases, and (c) nonrespiratory diseases, according to quarter-year in which absence began, experience of male employees in a public utility, 1933-42, inclusive (Logarithmic vertical scale)

time lost from short-term absences but only 43 percent of the time lost from sick absences of 1 day or longer.

The disability rates for all sickness and the two broad sickness groups are presented graphically in figure 1; the appropriate rates for the 4-day or longer absences are also shown. It will be noted that the variation in the rates for the longer absences, for each group of causes, follows closely the variation in the rates for all absences of 1 day or longer, the disability rate for absences of less than 4 days being markedly less in each quarter and year than the corresponding rate for absences of 4 days or more. This relationship for all sickness and the respiratory diseases is in striking contrast to the relationship of the corresponding frequency rates since in all but 3 of the 40 quarters (the exceptions being the first quarters of 1933, 1937, and 1941) the frequency of short-term absences was greater than the frequency of 4-day or longer absences.

The time lost from respiratory disease absences of each duration group reveals a regular seasonal variation similar to the periodic variation in frequency; this periodicity, lacking in the disability rates for the nonrespiratory diseases, is reflected in the rates for all sickness, the effect being most marked in the disability rates for the short-term absences. In any year the highest disability rate for short-term absences due to all sickness or the respiratory diseases is yielded by absences beginning in the first quarter, the second highest by absences beginning in the fourth quarter, the third highest by absences beginning in the second quarter, and the lowest by absences beginning in the third quarter; this phenomenon is not presented by the absences of longer duration.

RATIO OF TIME LOST FROM SHORT-TERM ABSENCES TO TOTAL TIME LOST

Quarterly ratios of time lost from short-term absences to the total time lost from all absences are given in table 1 for all sickness and the two broad sickness groups. The ratios, specific for quarter, are presented graphically in figure 2.

For all sickness the ratios range in value from 0.09 to 0.23, their mean being 0.13, while the means of the 10 ratios for each quarter are 0.14 for the first, 0.11 for the second, 0.13 for the third, and 0.14 for the fourth. The ratios for the respiratory diseases vary from 0.11 to 0.38 with a mean of 0.22, the mean ratios for the first, second, third, and fourth quarters becoming 0.18, 0.21, 0.25, and 0.22. The nonrespiratory disease ratios on the other hand range from 0 05 to 0.17 with a mean of 0.08; the quarterly means are 0.09, 0.07, 0.09, and 0.08 for the first, second, third, and fourth quarters.

When the time changes in the ratios, specific for quarter, are plotted for all sickness and the respiratory group of diseases, respectively, the two pictures of four curves each present a relatively large number of

crossings and recrossings of the quarterly curves. This contrasts sharply with the corresponding pictures shown by the frequency ratios, a smaller number of crossings of these quarterly curves being in evidence. In fact, the curve presenting the frequency ratios for the first quarter, for all sickness as well as for the respiratory group of diseases, carries generally the lowest quarterly ratios. Nor does the nonrespiratory group of diseases in the instance of the time-lost ratios show any orderliness when an examination is made of a graphic presentation of the ratios specific for quarter.

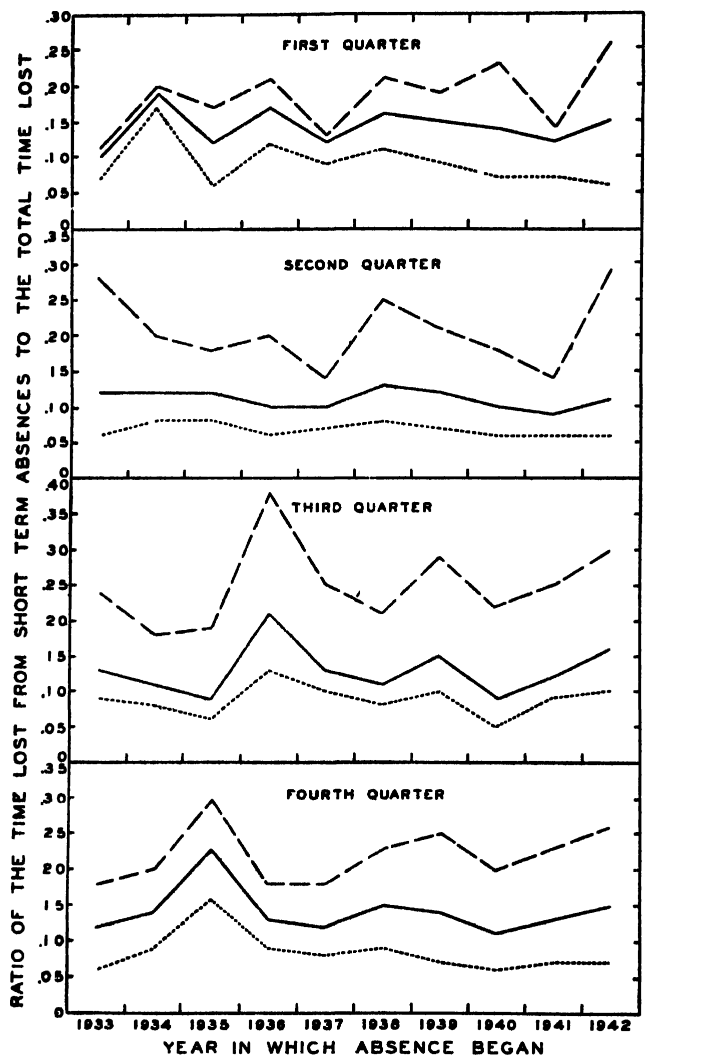

FIGURE 2.—Ratio of time lost from short-term absences (1-3 calendar days) to time lost from all absences (1 calendar day or longer) due to all sickness, respiratory diseases, and nonrespiratory diseases, according to quarter-year in which absence began; experience of male employees in a public utility, 1933–42, inclusive.

As figure 2 reveals, the ratios for a particular quarter are ordered with respect to cause group. For each quarter and year the proportion of the total time lost from the respiratory diseases accounted for by absences of less than 4 days is consistently greater than the corresponding proportion of time lost from all sickness, the proportions for all sickness being greater than the proportions for the nonrespiratory diseases. Differences between the ratios for all sickness and the respiratory diseases are least for the first quarter when the respiratory diseases contribute on the average 61 percent of all time lost from sickness, and greatest in the third quarter when the respiratory diseases are responsible for only 25 percent of the total time lost.

CORRELATION OF RATIO WITH TOTAL TIME LOST

To investigate the relationship between the proportion of time lost from short-term absences and the magnitude of the total disability rate, figure 3 presents appropriate scatter diagrams for all sickness, respiratory diseases, and nonrespiratory diseases, each of the 40 points for a particular cause group representing a ratio and its corresponding total disability rate. The identity of the quarter-year yielding absences contributing to a specific ratio and rate is shown by means of a pertinent symbol. Because of the relatively narrow range of the rates for the nonrespiratory group of diseases (from 2.0 to 5.9), the Y-axis applying to this group is divided into half-day intervals. The scatter diagrams aid in answering the question: Are increases in the annual number of days lost per person associated with increases or decreases in the proportion of days lost from less than 4-day absences? When increases are associated with increases the association is positive; when increases are associated with decreases the association is negative.

The scatter diagram for all sickness reveals little association between the value of the ratio and the magnitude of the total disability rate. If the 10 points for the first quarter are considered alone, definite negative association may be observed, the introduction of the points for the other quarters having a nullifying effect.

The diagram for the respiratory group of diseases shows clearly the higher values of the respiratory ratios. Contrary to the picture for all sickness the figure reveals the existence of some negative association, the important determining factor in the association being the contribution of the first quarters whose ratio-rate relationship is approximately linear.

The relationship for the nonrespiratory group of diseases also appears slightly negative in character, the higher values of the ratio tending to be associated with lower values of the disability rate.

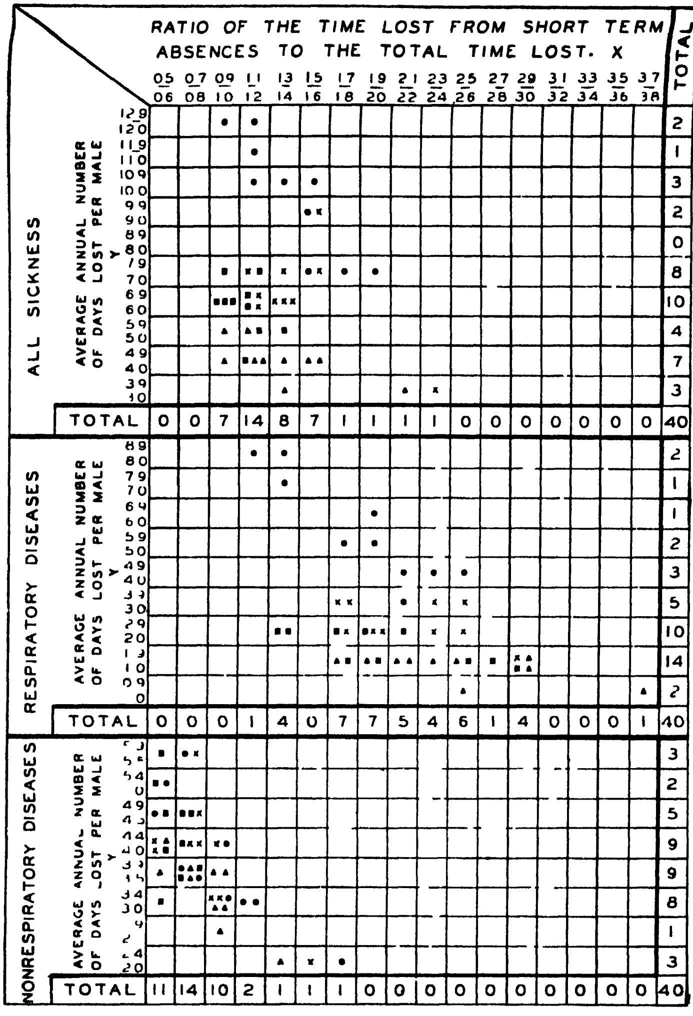

FIGURE 3.—Scatter diagrams showing relationship between proportion of time lost from short-term absences (1-3 calendar days) and total time lost from all absences (1 calendar day or longer) due to (a) all sickness, (b) respiratory diseases, and (c) nonrespiratory diseases, experience of male employees in a public utility, 1933-42, inclusive

DISCUSSION

Noteworthy in connection with the correlation of ratio with disability rate for the 3 cause groups is the varying degree of negative association exhibited by the 10 first-quarters themselves. The effect, as was seen, of this negative association on the total picture of 40 quarters for each of the 3 cause groups is quite different. Thus all sickness shows little association before, or after, the inclusion of the 10 first-quarters; the respiratory group, on the other hand, presents little association without the 10 first-quarters but some negative association after their inclusion. In both of these cause groups the respective

10 first-quarters concentrate themselves at the higher levels of the disability rate. The nonrespiratory group, with its 10 first-quarters distributed throughout the total correlation picture, shows slight negative association with or without the presence of the first-quarters.

The 10-year morbidity experience of the public utility workers reveals generally that the contribution of the short-term absence to the total time lost is relatively greater for the respiratory than for the nonrespiratory diseases, an observation in harmony with other sickness experiences. On the average 22 percent of the days lost on account of respiratory illness were due to absences of less than 4 days. the corresponding percentage for the nonrespiratory diseases being 8. Furthermore the 22 percent yielded by the short-term absences of respiratory origin is equivalent to 8.5 percent of the time lost from all absences due to all sickness, the corresponding percent for the 8 percent accounted for by the short-term absences of the nonrespiratory group being 4.5.

SUMMARY

This paper, the sixth of a series on the duration of disabling sickness, presents an investigation of time lost from short-term absences of less than 4 days, and its relation to the total time lost based on a 10-year disability experience of male public utility workers.

An examination of the average annual number of days lost per male from absences beginning in the 40 quarters of the 10-year period reveals that the time variation in this rate for absences of all durations follows closely the variation for absences of 4 days or more, the rates for the short-term absences being markedly less in magnitude than the corresponding rates for the longer absences.

For each quarter and year the proportion of total time lost from respiratory diseases accounted for by short-term absences is greater than the corresponding proportion for all sickness, the proportion for all sickness being greater than the proportion for the nonrespiratory causes.

Appropriate scatter diagrams showing the relationship between the proportion of time lost from short-term absences and the magnitude of the total disability rate revealed little association for all sickness, and some negative association for the respiratory and nonrespiratory groups of diseases.

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(*9*) Number V above.

DEATHS DURING WEEK ENDED SEPTEMBER 23, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 23, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	8,025	8,354
Average for 3 prior years	7,871	
Total deaths, first 38 weeks of year	343,524	350,471
Deaths under 1 year of age	564	643
Average for 3 prior years	590	
Deaths under 1 year of age, first 38 weeks of year	23,473	25,313
Data from industrial insurance companies:		
Policies in force	66,736,332	65,848,572
Number of death claims	11,942	12,974
Death claims per 1,000 policies in force, annual rate	9.4	10.3
Death claims per 1,000 policies, first 38 weeks of year, annual rate	10.1	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPT. 30, 1944

Summary

The incidence of poliomyelitis declined for the fourth successive week. A decrease was recorded in all of the 9 geographic divisions of the country except the West South Central and Pacific. A total of 976 cases was reported, as compared with 1,159 last week, a 5-year (1939–43) median of 591, and 679 for the corresponding week last year.

An aggregate of 835 cases, as compared with 970 last week, was reported in the 16 States reporting more than 12 cases each, as follows (last week's figures in parentheses): *Increases*—New Jersey 52 (40), Missouri 19 (15), California 18 (9); *decreases*—Massachusetts 22 (34), New York 366 (383), Pennsylvania 52 (82), Ohio 63 (77), Indiana 16 (20), Illinois 37 (38), Michigan 46 (75), Minnesota 32 (45), Maryland 29 (31), Virginia 23 (48), North Carolina 18 (23), Kentucky 24 (31); *no change*—West Virginia 18 (18).

The cumulative total for the first 39 weeks of the year is 14,547, or 35 percent more than the largest yearly total reported during the 11-year period preceding 1943. For the corresponding periods of 1943 and 1931 the cumulative totals were 9,309 and 12,250.

Of the total of 127 cases of meningococcus meningitis, as compared with 122 last week and 28 for the 5-year median, 61 occurred in the 5 States reporting more than 6 cases each, as follows (last week's figures in parentheses): New York 14 (13), Pennsylvania 17 (8), Ohio 7 (3), Illinois 12 (11), California 11 (11). The cumulative total for the first 39 weeks of the year is 13,856, or only 4.6 percent less than for the corresponding period last year, but 40 percent more than for the entire year 1929, when the largest yearly total recorded prior to 1943 was reported.

Delayed information was received reporting the occurrence in August of 108 cases of paratyphoid fever in a girls' school in Alabama.

Deaths recorded for the week in 92 large cities of the United States totaled 7,946, as compared with 7,986 last week and a 3-year (1941–43) average of 8,189. The cumulative total is 349,704, as compared with 357,184 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Sept 30, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median, 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Sept 30 1944	Oct, 2 1943		Sept 30 1944	Oct 2 1943		Sept 30 1944	Oct 2 1943		Sept 30 1944	Oct 2 1943	
NEW ENGLAND												
Maine	0	0	0				0	19	4	0	1	1
New Hampshire	0	0	0		1		0	1	0	0	1	0
Vermont	0	0	0				1	4	4	0	0	0
Massachusetts	1	9	3				30	66	53	5	10	1
Rhode Island	0	0	1	6			3	7	4	1	3	0
Connecticut	1	2	2		2	1	6	8	8	4	2	1
MIDDLE ATLANTIC												
New York	6	12	10	[1] 1	[1] 4	[1] 6	15	114	48	14	31	5
New Jersey	3	4	3	1	2	3	10	60	27	6	8	1
Pennsylvania	5	18	12	1	1		20	34	51	17	12	4
EAST NORTH CENTRAL												
Ohio	8	11	8	7	4	5	6	45	22	7	12	0
Indiana	7	28	9	3	2	4	2	4	4	1	8	0
Illinois	6	7	11		2	3	15	45	18	12	13	1
Michigan [2]	7	2	[illegible]			3	7	251	38	6	6	1
Wisconsin	3	2	1	[illegible]	9	33	40	99	48	2	4	0
WEST NORTH CENTRAL												
Minnesota	9	7	2		3	2	3	70	6	0	5	0
Iowa	[illegible]	10	[illegible]				0	2	5	0	0	0
Missouri	1	19	4	2	1		0	9	3	2	6	1
North Dakota	2	1	2		10	3	0	186	4	0	2	0
South Dakota	4	6	1				1	4	1	0	0	0
Nebraska	0	3	3				5	4	4	0	0	0
Kansas	4	4	4		5	4	4	7	7	3	3	1
SOUTH ATLANTIC												
Delaware	0	0	0				2	6	2	0	2	0
Maryland [3]	2	3	4		[illegible]	2	0	7	7	2	5	2
District of Columbia	0	0	1	1			1	1	1	0	2	0
Virginia	11	16	16	72	53	41	0	27	16	2	3	3
West Virginia	[illegible]	10	8	2		3	0	13	2	1	1	1
North Carolina	24	38	69	3	7	2	4	9	11	1	1	0
South Carolina	17	[illegible]	31	202	141	160	29	15	2	2	1	1
Georgia	10	29	29	[illegible]	41	20	2	5	5	1	0	0
Florida	12	5	[illegible]	3	4	4	0	1	2	0	4	1
EAST SOUTH CENTRAL												
Kentucky	[illegible]	15	14	2	3	2	1	2	11	1	4	0
Tennessee	14	23	23	4	7	7	5	2	5	2	1	1
Alabama	[illegible]	29	29	4	35	7	2	11	7	6	0	0
Mississippi [4]	20	7	10							4	0	0
WEST SOUTH CENTRAL												
Arkansas	4	5	15	27	9	16	4	1	3	0	0	0
Louisiana	[illegible]	5	6	2	1	2	0	1	1	3	2	2
Oklahoma	4	5	9	25	11	11	2	4	1	0	1	0
Texas	52	32	32	451	456	350	24	17	15	5	0	2
MOUNTAIN												
Montana	0	0	0	5	1	1	1	51	14	0	1	0
Idaho	0	0	0				0	6	3	0	2	0
Wyoming	2	0	0	1			1	1	1	0	0	0
Colorado	6	3	4	15	16	16	5	15	8	1	3	0
New Mexico	5	1	3	2			6	0	0	0	0	0
Arizona	0	3	2	16	55	43	2	5	5	0	2	0
Utah [4]	0	0	0				3	2	2	0	0	0
Nevada	0	0	0				0	3	0	0	0	0
PACIFIC												
Washington	8	6	3		1	1	9	16	16	3	4	0
Oregon	1	1	3	4	1	7	23	22	15	2	4	0
California	30	19	14	15	12	14	110	92	72	11	22	1
Total	352	425	444	888	905	876	404	1 374	668	127	192	28
39 weeks	8 406	9 063	9 581	342 470	85 825	154 152	593 899	542 892	470 048	13 856	14 523	1 602

See footnotes at end of table

Telegraphic morbidity reports from State health officers for the week ended Sept 30 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Poliomyelitis, Week ended Sept 30 1944	Poliomyelitis, Week ended Oct 2 1943	Poliomyelitis, Median 1939-43	Scarlet fever, Week ended— Sept 30 1944	Scarlet fever, Week ended— Oct 2 1943	Scarlet fever, Median 1939-43	Smallpox, Week ended— Sept 30 1944	Smallpox, Week ended— Oct 2 1943	Smallpox, Median 1939-43	Typhoid and paratyphoid fever[3], Week ended— Sept 30 1944	Typhoid and paratyphoid fever[3], Week ended— Oct 2 1943	Typhoid and paratyphoid fever[3], Median 1939-43
NEW ENGLAND												
Maine	1	3	1	15	14	4	0	0	0	0	2	0
New Hampshire	4	0	0	2	0	1	0	0	0	0	0	0
Vermont	1	0	0	3	2	2	0	0	0	2	0	0
Massachusetts	22	31	7	64	173	68	0	0	0	7	7	1
Rhode Island	0	18	1	4	6	3	0	0	0	0	0	0
Connecticut	10	32	3	[illegible]	11	17	0	0	0	7	0	1
MIDDLE ATLANTIC												
New York	366	52	52	[illegible]	131	93	0	0	0	7	[illegible]	18
New Jersey	52	7	9	21	30	32	0	0	0	2	0	5
Pennsylvania	52	8	13	77	87	87	0	0	0	10	13	17
EAST NORTH CENTRAL												
Ohio	63	12	12	110	183	93	1	0	0	7	9	12
Indiana	16	7	7	29	25	25	1	0	0	0	3	3
Illinois	37	118	37	81	87	85	0	0	0	4	1	14
Michigan[2]	46	15	26	50	63	62	0	0	0	3	3	4
Wisconsin	12	19	8	43	88	61	0	0	0	1	4	2
WEST NORTH CENTRAL												
Minnesota	32	9	16	26	32	32	0	1	0	0	0	0
Iowa	9	16	16	20	28	28	0	0	0	18	0	1
Missouri	19	22	4	17	34	25	0	0	0	5	3	13
North Dakota	1	1	1	3	7	7	0	1	1	0	3	0
South Dakota	1	0	0	5	9	8	0	0	0	1	0	0
Nebraska	4	8	8	15	10	12	0	0	0	0	0	0
Kansas	7	32	9	30	57	41	0	0	0	1	0	3
SOUTH ATLANTIC												
Delaware	7	0	0	1	1	3	0	0	0	0	1	1
Maryland[2]	29	3	2	33	18	18	0	0	0	5	3	7
District of Columbia	9	1	1	9	10	10	0	0	0	2	1	1
Virginia	23	8	8	25	46	36	0	0	0	2	8	15
West Virginia	18	4	4	58	72	43	1	0	0	4	15	15
North Carolina	18	0	4	37	111	78	0	0	0	3	1	[illegible]
South Carolina	3	1	3	9	12	12	0	0	0	6	6	8
Georgia	3	1	1	13	21	20	0	0	0	2	2	13
Florida	4	0	1	9	5	4	0	0	0	6	1	4
EAST SOUTH CENTRAL												
Kentucky	24	7	7	28	47	47	0	0	0	1	6	14
Tennessee	6	0	4	36	47	47	0	0	0	3	5	12
Alabama	4	2	1	23	17	27	0	0	0	[illegible]	1	4
Mississippi[2]	9	1	1	7	6	10	0	0	0	4	2	3
WEST SOUTH CENTRAL												
Arkansas	1	0	1	6	2	4	0	0	0	5	1	8
Louisiana	4	1	2	9	6	6	0	0	0	3	5	5
Oklahoma	2	22	3	10	10	12	0	0	0	3	3	7
Texas	7	26	4	34	22	22	0	2	1	13	12	22
MOUNTAIN												
Montana	5	3	0	8	21	10	0	0	0	1	0	0
Idaho	0	0	1	15	7	7	0	0	0	2	2	2
Wyoming	0	1	1	1	5	2	0	0	0	0	1	0
Colorado	4	17	2	11	14	14	0	0	0	1	4	2
New Mexico	0	3	2	3	5	1	0	0	0	2	7	6
Arizona	2	3	1	5	[illegible]	2	0	0	0	0	4	3
Utah[2]	0	18	3	11	16	7	0	0	0	0	1	1
Nevada	1	1	0	0	6	0	0	0	0	0	0	0
PACIFIC												
Washington	8	19	4	29	37	21	0	0	0	2	2	2
Oregon	12	20	3	16	13	9	0	1	0	1	1	6
California	18	98	17	104	96	72	0	0	0	2	6	7
Total	976	679	591	1 253	1,756	1 385	3	5	5	155	168	29[illegible]
39 weeks	[4]14 547	9 309	6 363	152 962	104 359	104 359	320	630	1,212	4 336	4 352	6 481

See footnotes at end of table

Telegraphic morbidity reports from State health officers for the week ended Sept. 30, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Sept. 30, 1944	Whooping cough: Week ended— Oct. 2, 1943	Whooping cough: Median 1939–43	Week ended Sept. 30, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	4	16	27	0	0	0	0	0	0	0	0	0
New Hampshire	12	1	1	0	0	0	0	0	0	0	0	0
Vermont	5	12	12	0	0	0	0	0	0	0	0	0
Massachusetts	52	82	104	0	0	9	0	2	0	0	0	0
Rhode Island	19	61	26	0	0	0	0	0	0	0	0	0
Connecticut	27	10	38	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	197	176	274	0	2	61	0	1	0	0	0	0
New Jersey	70	81	118	0	0	0	0	1	0	0	0	0
Pennsylvania	109	136	250	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	138	104	160	0	0	0	0	0	0	0	0	0
Indiana	6	34	30	0	0	0	0	0	0	0	0	0
Illinois	72	145	157	0	1	1	0	2	0	0	3	0
Michigan [3]	60	191	193	0	0	4	0	0	0	0	0	0
Wisconsin	106	220	187	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	37	52	52	0	2	0	0	1	0	0	1	0
Iowa	2	27	21	0	0	0	0	0	0	0	0	0
Missouri	24	23	23	0	0	0	4	0	0	0	1	0
North Dakota	4	13	22	0	0	0	0	1	0	0	0	0
South Dakota	4	14	3	1	0	0	0	0	0	0	0	0
Nebraska	0	16	7	0	0	0	0	0	0	0	0	0
Kansas	28	28	28	0	0	0	0	2	0	0	0	0
SOUTH ATLANTIC												
Delaware	2	6	6	0	0	0	0	0	0	0	0	0
Maryland [3]	47	64	64	0	0	0	2	0	0	1	0	0
District of Columbia	1	9	9	0	0	0	0	0	0	0	0	0
Virginia	11	59	45	0	0	0	185	0	0	0	0	0
West Virginia	10	6	7	0	0	0	0	0	0	0	0	0
North Carolina	150	105	99	0	0	0	0	0	0	0	0	8
South Carolina	62	39	22	0	0	12	0	0	0	0	0	3
Georgia	[illegible]	26	10	0	0	3	0	0	0	0	1	34
Florida	1	21	5	0	1	0	0	0	0	0	0	17
EAST SOUTH CENTRAL												
Kentucky	24	33	52	0	0	1	0	0	0	0	0	0
Tennessee	19	21	21	0	0	0	2	0	0	1	0	11
Alabama	16	25	25	0	0	0	0	1	0	0	0	24
Mississippi [2]				0	0	0	0	0	0	0	2	2
WEST SOUTH CENTRAL												
Arkansas	28	20	6	0	2	18	0	0	0	0	1	0
Louisiana	[illegible]	5	5	0	1	1	0	0	0	0	2	6
Oklahoma	2	3	5	0	0	0	12	0	0	1	0	0
Texas	157	123	104	0	7	355	12	4	0	0	1	35
MOUNTAIN												
Montana	10	10	7	0	0	0	0	0	0	0	0	0
Idaho	0	2	2	0	0	0	0	0	0	0	0	0
Wyoming	10	4	4	0	0	0	0	0	0	0	0	0
Colorado	14	32	23	0	0	0	0	1	0	0	1	0
New Mexico	0	1	24	0	0	3	10	0	0	0	0	0
Arizona	2	9	12	0	0	0	9	0	0	0	0	0
Utah [2]	21	24	21	0	0	0	0	0	0	0	1	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	14	71	36	0	0	0	0	0	0	0	0	0
Oregon	24	32	19	0	0	0	0	0	0	0	0	0
California	64	141	202	0	1	10	0	2	0	0	0	2
Total	1,67[illegible]	2,333	2,450	1	26	478	236	18	0	3	14	142
Same week 1943	2,333			1	52	470	191	14	0	4	5	130
Same week 1942	2,450			0	29	279	203	9	1	7	12	76
39 weeks 1944	73,563			35	1,301	17,134	6,873	509	23	433	444	3,742
39 weeks 1943	147,659			49	1,634	12,884	6,238	554	19	412	660	3,076
39 weeks 1942	139,386		[4] 141,753	63	876	9,636	5,499	429	36	[4] 434	721	[4] 2,100

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever cases reported separately as follows: Massachusetts, 5; New York, 1; Michigan, 1; Maryland, 1; South Carolina, 2; Georgia, 1; Florida, 2; Texas, 1; Colorado, 1.
[4] 5-year median 1939–43.
[5] Exclusive of delayed report of 108 cases of paratyphoid fever which occurred in August, included in cumulative total only.
[6] Cumulative total changed by corrected reports.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 16, 1944

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	2	0	3	0	0	0
New Hampshire												
Concord	0	0		0	0	0	1	0	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	3
Massachusetts												
Boston	1	0		0	13	1	5	7	14	0	0	34
Fall River	0	0		0	0	0	0	0	0	0	0	8
Springfield	0	0		0	1	0	0	[illegible]	1	0	1	0
Worcester	0	0		0	0	0	5	0	9	0	0	7
Rhode Island												
Providence	0	0		0	0	0	0	0	0	0	1	8
Connecticut												
Bridgeport	0	0		0	0	0	0	0	0	0	0	0
Hartford	0	0		0	1	0	0	3	1	0	1	4
New Haven	0	0		1	0	0	1	0	1	0	0	14
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	1	2	39	4	0	1	0
New York	14	0		1	2	[illegible]	40	17	34	0	4	72
Rochester	0	0		0	6	0	0	29	0	0	1	[illegible]
Syracuse	0	0		0	0	0	3	9	0	0	0	10
New Jersey												
Camden	1	0		0	0	3	0	2	0	0	0	0
Newark	0	0		0	1	0	1	1	3	0	2	9
Trenton	0	0		0	0	0	1	0	0	0	0	0
Pennsylvania												
Philadelphia	1	0		0	3	4	10	21	11	0	2	14
Pittsburgh	0	0		0	0	3	11	9	3	0	3	8
Reading	0	0		0	0	1	0	0	0	0	0	1
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		1	0	1	1	16	7	0	0	11
Cleveland	0	0		0	1	2	5	36	7	0	0	27
Columbus	0	0		0	1	0	1	4	2	0	0	12
Indiana												
Fort Wayne	0	0		0	0	0	0	0	0	0	0	0
Indianapolis	1	0		0	0	1	0	3	3	0	0	5
South Bend	0	0		0	0	0	0	0	0	0	2	0
Terre Haute	0	0		0	0	0	0	1	1	0	0	0
Illinois												
Chicago	1	0	1	0	7	8	13	11	18	0	0	60
Springfield	0	0		0	0	0	3	0	0	0	0	0
Michigan												
Detroit	3	0	1	1	0	3	8	35	6	0	0	39
Flint	1	0		0	1	0	2	3	3	0	0	6
Grand Rapids	0	0		0	1	0	1	2	1	0	0	3
Wisconsin												
Kenosha	0	0		0	0	0	0	0	1	0	0	28
Milwaukee	0	0		0	4	3	3	4	1	0	0	60
Racine	0	0		0	2	0	0	0	0	0	0	8
Superior	0	0		0	1	0	0	0	1	0	0	2
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	0	3	1	0	0	0
Minneapolis	4	0		0	2	1	1	12	4	0	0	2
St Paul	0	0		0	0	0	2	7	1	0	0	14

City reports for week ended September 16, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri												
Kansas City	0	0		0	0	0	3	1	6	0	0	1
St Joseph	0	0		0	0	0	0	0	3	0	0	0
St Louis	0	0	1	0	1	0	5	2	1	0	2	7
North Dakota												
Fargo	0	1		0	0	0	1	2	1	0	0	0
Nebraska												
Omaha	0	0		0	2	0	2	1	0	0	0	3
Kansas												
Topeka	1	0		0	0	0	1	0	1	0	0	5
Wichita	0	0		0	0	0	3	0	0	0	1	1
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	0	4	0	0	0	3
Maryland												
Baltimore	1	0		0	2	0	3	19	10	0	3	60
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0		0	0	0	4	16	3	0	0	2
Virginia												
Lynchburg	0	0		0	0	0	1	19	1	0	0	6
Richmond	0	0		0	1	0	1	3	3	0	1	10
Roanoke	0	0		0	0	0	0	3	0	0	0	0
West Virginia												
Charleston	0	0		0	0	0	0	0	2	0	0	0
Wheeling	0	0		0	0	0	1	0	0	0	0	3
North Carolina												
Raleigh	0	0		0	0	0	1	0	0	0	0	1
Wilmington	0	0		1	0	0	0	1	0	0	0	3
Winston-Salem	0	0		0	0	0	2	4	4	0	0	1
South Carolina												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Georgia												
Atlanta	0	0	1	1	1	0	0	1	2	0	0	2
Brunswick	0	0		0	0	0	1	0	0	0	0	0
Savannah	0	0		0	0	0	0	0	1	0	0	0
Florida												
Tampa	1	0		0	0	0	2	1	0	0	1	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0		0	1	1	8	2	2	0	0	17
Nashville	0	0		0	0	1	2	1	1	0	0	1
Alabama												
Birmingham	1	0		0	0	0	3	0	0	0	1	0
Mobile	0	0		0	0	0	0	0	0	0	2	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0	4	0	0	0	0	0	0	0	0	7
Louisiana												
New Orleans	1	0	1	0	0	0	3	2	3	0	1	2
Shreveport	0	0		0	0	0	2	0	0	0	0	0
Texas												
Dallas	0	0		0	0	0	0	0	0	0	0	14
Galveston	0	0		0	0	0	1	0	0	0	0	0
Houston	1	0		0	0	0	1	1	1	0	0	3
San Antonio	2	0		0	0	0	6	3	0	0	0	0
MOUNTAIN												
Montana												
Billings	0	0	----	0	0	0	1	0	0	0	0	1
Great Falls	0	0	-	0	0	0	0	0	1	0	0	1
Helena	0	0	-	0	0	0	0	0	0	0	0	5
Missoula	0	0	---	0	0	0	1	0	1	0	0	0

City reports for week ended September 16, 1944—Continued

	Diphtheria cases	Encephalitis, infectious cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
MOUNTAIN—continued												
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	4	1	1	0	0	0	4	3	5	0	0	17
Pueblo	0	0		0	1	0	0	0	1	0	1	1
Utah												
Salt Lake City	0	0		0	0	0	0	0	2	0	0	1
PACIFIC												
Washington												
Seattle	0	0		0	2	0	6	1	4	0	0	5
Spokane	0	0		0	3	0	1	0	1	0	0	1
Tacoma	1	0		0	1	3	0	0	2	0	0	3
California												
Los Angeles	8	0	3	0	10	5	1	7	16	0	2	12
Sacramento	0	0		0	6	0	0	0	1	0	0	0
San Francisco	0	0		0	12	5	8	2	3	0	0	2
Total	49	2	13	6	90	52	210	538	223	0	33	665
Corresponding week, 1943	46		33	11	170		209		297	1	29	1009
Average 1939-43	56		36	[1] 9	[2] 148		[1] 222		274	1	40	909

[1] 3-year average 1941-43

[2] 5-year median 1939-43

Dysentery, amebic—Cases Boston 1 New York 1 Philadelphia 1 Chicago 1

Dysentery, bacillary—Cases Worcester 7 New York, 6 Philadelphia, 1 Chicago 1 Detroit, 5 Washington D C 1 Charleston, S C, 7 Memphis, 4 Nashville, 1 Los Angeles 7

Dysentery unspecified—Cases Baltimore, 2 Richmond, 1, Shreveport, 1 Houston 2

Tularemia—Cases New Orleans 1

Typhus fever, endemic—Cases Philadelphia, 1 Charleston, S C 5 Savannah 1 Tampa 2 Nashville 2 Birmingham, 5 Mobile, 10 New Orleans, 8, Dallas, 1, Houston, 3, San Antonio 2 Los Angeles 1

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (estimated population, 1943, [illegible],394,800)

	Diphtheria case rates	Encephalitis infectious case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	2.6	0		2.6	39	2.6	36.6	44.4	76	0	7.8	204
Middle Atlantic	7.4	0		0.5	6	7.9	34.3	131.9	25	0	6.0	55
East North Central	3.6	0	1.2	1.2	11	10.9	22.5	69.9	31	0	1.2	159
West North Central	9.9	2	2	0	10	2	35.8	55.7	36	0	6	66
South Atlantic	3.3	0	1.6	3.3	7	0	31.1	116.0	42	0	8.2	132
East South Central	11.8	0		0	6	11.8	76.7	17.7	18	0	17.7	106
West South Central	11.5	0	14.3	0	0	0	37.3	17.2	11	0	2.9	75
Mountain	31.8	7.9	7.9	0	8	0	47.7	23.8	79	0	7.9	207
Pacific	14.2	0	4.7	0	54	20.6	25.3	15.8	43	0	3.2	36
Total	7.4	3	2.0	9	14	7.9	31.9	81.8	34	0	5.0	101

FOREIGN REPORTS

ANGOLA

Notifiable diseases—April–June 1944.—During the months of April, May, and June 1944, certain notifiable diseases were reported in Angola as follows:

Disease	April		May		June	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Beriberi	14		42		28	
Cerebrospinal meningitis	2	1			3	3
Chickenpox	19		11	1	16	
Diphtheria	3	1	2	1	3	
Dysentery (amebic)	111	5	185	13	132	6
Dysentery (bacillary)	13	1	15	2	4	
Gonorrhea	188		208		215	
Hookworm disease	398	5	531	6	543	12
Influenza	1 283	20	1 [illegible]	12	1 308	32
Leprosy	[illegible]	1	3		6	
Measles	[illegible]		24	1	59	
Mumps	8		3		16	1
Pneumonia	[illegible]	37	300	38	320	46
Poliomyelitis	1		1			
Rabies			1	1		
Relapsing fever	32		26		26	
Septicemia	1	1			1	
Sleeping sickness	134	8	113	7	117	12
Smallpox	19		2		2	
Syphilis	[illegible]	1	[illegible]		427	1
Tetanus	4	3	1		2	[illegible]
Trachoma			1		2	
Tuberculosis (respiratory)	39	14	44	[illegible]	37	6
Typhoid and paratyphoid fever	33	3	21	2	24	2
Whooping cough	137	10	148	4	114	2
Yaws	847		1 0[illegible]1		1 149	1

CANADA

Provinces—Communicable diseases—Week ended September 2, 1944.—During the week ended September 2, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		7		4	18	5	5	15	38	92
Diphtheria		6	1	56	1	1	1		1	67
Dysentery (bacillary)				12					4	16
Encephalitis, infectious						1				1
German measles					1		2	3	12	18
Influenza					5				22	27
Measles		1	1	14	11	10	2	15	11	65
Meningitis, meningococcus							1			1
Mumps				8	12	3		11	14	48
Poliomyelitis		2	9	2	[1] 27	5		14		[1] 59
Scarlet fever		2	3	35	23	8	5	14	17	107
Tuberculosis (all forms)		2	11	128	47	12	1	21	14	236
Typhoid and paratyphoid fever			2	18			1	3	3	27
Whooping cough		25		73	35	4	11	25	40	213

[1] Includes 3 cases delayed reports.

CUBA

Provinces—Notifiable diseases—4 weeks ended September 9, 1944.—During the 4 weeks ended September 9, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	5	3		15	24
Diphtheria	1	19	1	2		3	26
Dysentery		12	1				13
Hookworm disease		1					1
Leprosy		4				8	12
Malaria	16	7		8	4	307	342
Measles		4	2			1	7
Poliomyelitis					1		1
Tuberculosis	16	41	9	18		65	149
Typhoid fever	13	99	11	80	17	72	292
Undulant fever						1	1
Yaws						7	7

NOTE. 1 case of rickettsial disease (endemic typhus fever?) was also reported.

[1] Includes the city of Habana.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence only those places are included which had not previously reported any of the above mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Portugal Azores—Ponta Delgada (vicinity of).—For the week ended September 2, 1944, 1 fatal case of plague was reported in a village about 3 miles from the port of Ponta Delgada, Azores. For the week ended September 9, 1944, 2 cases of plague were reported from the same locality.

French West Africa Dakar.—For the week ended September 2, 1944, 38 cases of plague with 31 deaths were reported in Dakar, French West Africa.

Typhus Fever

Basutoland.—For the period July 11–30, 1944, 72 cases of typhus fever with 14 deaths were reported in Basutoland.

Yellow Fever

Gold Coast.—On August 14, 1944, 1 fatal case of suspected yellow fever was reported in Cape Coast, Gold Coast. The fatal case of suspected yellow fever in Tamale as reported on page 1265 of the PUBLIC HEALTH REPORTS of September 22, 1944, has not been confirmed.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, ***Surgeon General***

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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AN EPIDEMIC OF A SEVERE PNEUMONITIS IN THE BAYOU REGION OF LOUISIANA

II. CLINICAL FEATURES OF THE DISEASE

By W. L. Treuting, M. D., *State Department of Health of Louisiana*, and B. J. Olson, *Surgeon, United States Public Health Service*

The purpose of this report is to present the clinical findings in an epidemic of a severe pneumonitis with a high mortality occurring in the bayou region of Louisiana between December 1942 and May 1943. A total of 19 cases in white adults of French descent was studied. The clinical picture presented is based on the study by the authors of 4 patients during their illness; data on the remaining cases were obtained from attending physicians All surviving patients were kept under observation for a year following recovery.

The onset of the disease was mild, with headache, general malaise, backache, and chilly sensations as the first symptoms. They appeared after an incubation period of 6 to 19 days and persisted throughout the illness. The temperature usually rose from 99° to 101° F. on the first day to 103° to 105° F. between the fourth and seventh days; concurrently, pulse and respiratory rates gradually increased. Pneumonitis was demonstrable on the third day of illness by X-ray or physical examination but without symptoms referrable to the chest. Despite the high fever and pneumonitis the patients appeared and felt remarkably well. During the second week the volume of the pneumonitic process increased in the affected lobes and often extended to the other lobes of the lung; meanwhile the temperature remained high and the pulse and respiratory rates rapid. In this stage of the disease episodes of "collapse" were not infrequent. Without premonitory signs, the patient became weak and listless, the pulse rapid and thready, and cyanosis occurred or, if already present, became intense. Either death occurred or, if the patient rallied, a series of such episodes was not uncommon, followed by either recovery or death. After each episode there was an increase in the

respiratory rate which did not invariably parallel a demonstrable extension of the pneumonitis.

There was a long period of acute illness marked by high fever, delirium, episodes of "collapse," and rapid pulse and respiratory rates. Cough productive of bloody mucoid sputum developed in severe cases late in the first or second week of disease. Death, if it occurred, was usually between the seventh and fourteenth days of illness. Recovery was indicated by a gradually subsiding temperature and pulse rate, The improvement in the respiratory rate lagged far behind that in temperature and pulse. Convalescence was slow and extended over a period of months.

Skin.—No rash or purpura was present at any time.

Eyes, ears, nose, mouth, and throat.—Eyes and ears were negative. Epistaxis occurred at intervals in case 10 from the third to the fifth day of illness. Small painful ulcers on the buccal mucosa were observed in case 19 on the fifth day. Four patients complained of a mild sore throat (cases 15, 17, 18, 19).

Chest.—Five patients complained of moderate chest pain at some time during illness (cases 3, 6, 7, 11, 17). Abnormalities in the chest were found only by auscultation or X-ray. Fine crepitant râles were present over the involved areas, unique in their high pitch, not accentuated but rather decreased by coughing. No patient developed pleurisy or empyema.

X-ray pictures.—The following two cases showed findings typical of all X-rayed—eight in number (described by Dr. R. A. Brown, New Orleans):

Case 18 (fatal) (figs. 1 and 2).— The X-ray film taken on the third day of illness shows a well-circumscribed homogeneous density 1½ x 3 cm. in the midzone at the third anterior rib level of the right lung. The remaining lung fields are clear. A film taken on the seventh day shows an increase in the size of the density in the right lung field to 3 x 9 cm. There is another homogeneous density 4 x 6 cm. in the outer zone from the fifth to the seventh anterior rib level fusing with a less dense shadow extending to the diaphragm. The left lung field shows a strandlike area of mottling extending from the upper horn of the left hilum out to the midzone in the first anterior interspace level. There is also another homogeneous density 4 x 6 cm. in the outer zone at the third to the fifth anterior rib level, with another small density below this level.

Case 19 (nonfatal) (figs. 3, 4, 5).—The X-ray film taken on the fourth day of illness shows a fairly homogeneous, poorly circumscribed density 9 x 5 cm. extending from the fourth anterior rib level in the inner zone toward the mid- and outer zones on the right side. The other lung field is clear. The film taken on the eighth day of illness shows an increase in this area of density to 11½ x 8½ cm., with the remaining lung fields clear. The X-ray taken on the fifteenth day of illness shows that the area of pneumonitis had almost cleared, and both lung fields were completely clear when X-rayed on the twenty-sixth day.

Cough and sputum:—Cough was usually not present until the end of the first week or in the second week of illness. It was never severe.

FIGURE 1 X ray picture of chest of Case 18 on third day of illness

FIGURE 2 X ray picture of chest of Case 18 on seventh day of illness

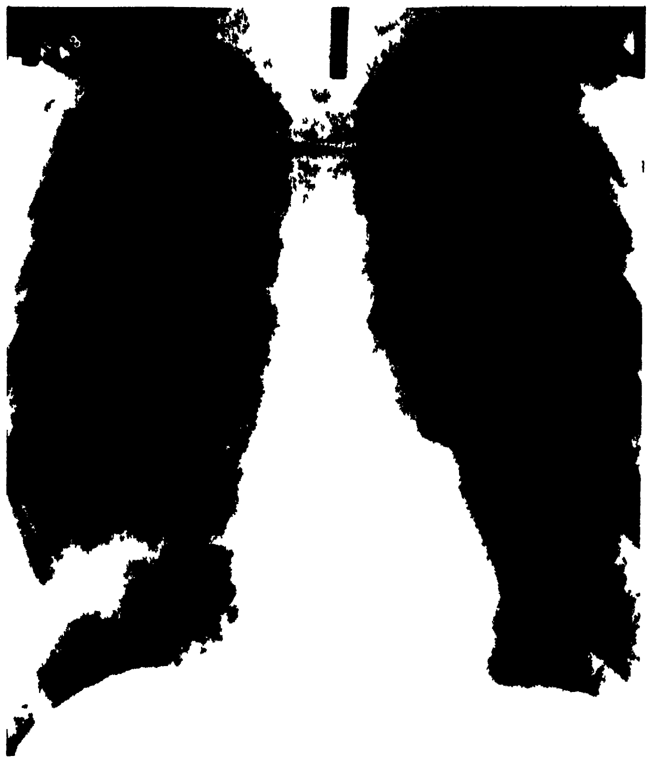

FIGURE 3. X-ray picture of chest of Case 19 on fourth day of illness

FIGURE 4. X-ray picture of chest of Case 19 on eighth day of illness

FIGURE [illegible] X-ray picture of chest of Case 14 on fifteenth day of illness

Blood-streaked or rusty, mucoid, thick, tenacious sputum was raised, usually late in the illness.

Gastrointestinal tract.—Nausea and vomiting occurred in six cases beginning on the second day and only after therapy with a sulfonamide. Abdominal pain was uncommon, occurring in only two cases: case 10 developed an epigastric pain on the ninth day just prior to a collapse; case 6 complained of abdominal pain just prior to a miscarriage on the thirty-third day of illness. Abdominal distention occurred and persisted in five cases, requiring constant treatment Diarrhea did not occur; it was necessary to resort to enemas or cathartics.

Genitourinary system.—Negative.

Circulatory system.—"Collapse" at some time during the illness was common, marked by a sudden feeling of weakness followed by a rapid pulse of small volume, increased respiratory rate, and shallow breathing. The blood pressure in case 7 on the tenth day of illness, shortly after a "collapse" was 120/75. Case 8 had a blood pressure of 104/60 on the ninth day of illness when she was in a critical condition. Cyanosis occurred in all but five cases, either before, during, or after a "collapse," from the fourth to the thirty-first day of illness, occurring more frequently and earlier in fatal cases than in nonfatal ones.

Nervous system A common early symptom was a dull to severe headache which usually persisted throughout the illness. It was partially relieved by treatment with aspirin or codeine. Delirium or coma was present in 13 cases, beginning sometime between the fifth and twenty-first days The delirium varied from a mild to a wild maniacal form requiring restraint and medication to effect control. Three cases had amnesia for the period of illness. A definite serious mental unbalance occurred in 2 cases, one of which regained her mental balance 3 months after convalescence. The other was not completely mentally competent after 1 year. Two individuals went through a period of depression and a change in personality which gradually cleared up over a period of months, though they continued to be easily upset emotionally. No paralysis or other unfavorable motor manifestation was noted.

Pulse, temperature, and respiration.—These are given in detail in figures 6 to 12. It will be noted that the temperature is of septic, fluctuating type. This is considered a characteristic of the disease and is probably not due to therapy with antipyretics. The fluctuations of temperature were accompanied by "chilly" sensations rather than severe chills. Respirations became rapid and shallow as the disease progressed, with resultant respiratory distress. Oxygen administered to nine cases improved the depth of respiration but did not affect the rate. The pulse rate during a "collapse" was rapid

and poor in quality. Digitalization was not effective in improving the quality of the pulse and in case 18 resulted in a partial heart block.

Laboratory examinations:

Blood.—Blood studies were available on seven cases and are given in detail in the case reports which follow. The leucocyte counts ranged from 4,720 to 16,000. The differential counts were normal.

Urine.—Essentially negative with a transient glycosuria present in two cases on days when the patients did not receive glucose intravenously.

Therapy.—Sulfathiazole, sulfapyridine, and sulfadiazine were all given adequate trial with no therapeutic effect. Convalescent plasma and whole blood were used in case 17 and case 18 late in the disease without effect; however, in case 19 it may have modified the disease. Pooled nonimmune plasma was given four cases at some time in their illness. It was used repeatedly in case 19 in addition to convalescent blood and plasma. This form of treatment did not receive adequate trial, but in view of the "recurring collapses," adequate and repeated use of nonimmune plasma, if immune plasma is not available, would be of interest. Other therapy was symptomatic.

Case 1.—Mrs. M., age 48 (patient of Dr. Y. Ardoin). Became ill at her rural home December 4, 1942. Onset of illness was abrupt, with a severe headache, chills, and high fever. The clinical condition became worse, and on December 12, 1942, the ninth day of illness, she was transferred by ambulance to the Ville Platte sanatorium. A diagnosis of pneumonia was made and treatment with sulfathiazole initiated. Her temperature, pulse, and respiration from the ninth day of illness until death are given in figure 6. Aside from general bodily discomfort, her main complaint was recurrent chills followed by profuse perspiration. Nausea and vomiting occurred on the tenth day of illness. A cough which developed on the thirteenth day produced a thick, mucoid, bloody sputum. On the fourteenth day, between 12 p. m and 1 a. m., her condition suddenly grew worse. Respiration became rapid and very shallow, the pulse rate increased to 134, and she became cyanotic and comatose. A sudden drop in temperature occurred. She was placed in an oxygen tent and given caffeine sodium benzoate and digitalis intramuscularly. By 2:40 a. m. her color and respiration improved, but she remained unconscious until death the following day at 4:15 p. m.

Laboratory findings

Date	*White blood cells*	*Red blood cells*	*Hemoglobin (percent)*
Dec. 12, 1942	12, 600	4, 050, 000	80
Dec. 13, 1942	10, 300		
Dec. 14, 1942	14, 400	4, 480, 000	

Urine.—Examination December 12, 1942, was negative. A Widal agglutination test December 13, 1942 was also negative.

Therapy:

Sulfathiazole.—Seventeen gm. of sulfathiazole were given orally from the ninth to the eleventh day, with an additional 5 gm. administered on the fourteenth and fifteenth day of illness—total, 22 gm.

Aspirin—Ten grains of aspirin were given per day from December 12 to 15, 1942. A single dose of 5 gr. was given on December 15 and 16.

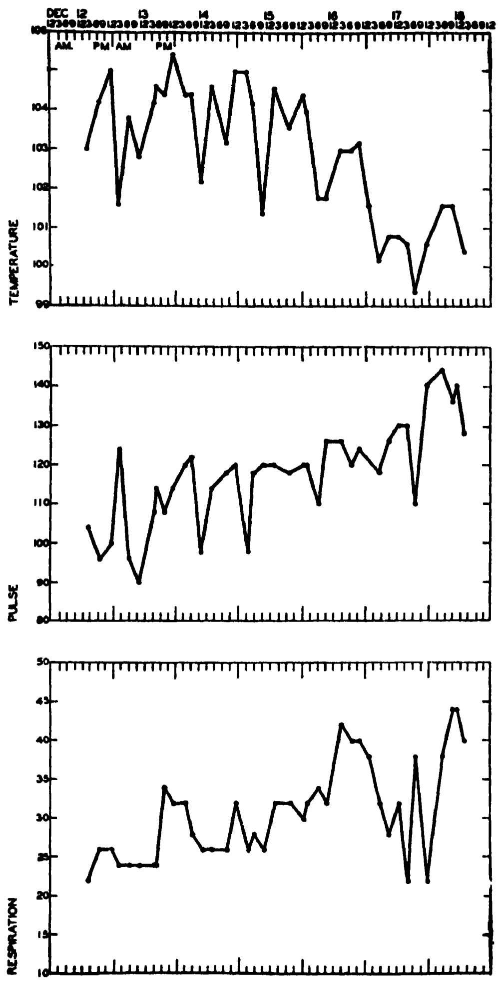

FIGURE 6.—Case 1 Temperature, pulse, and respiration from December 12, 1942, the ninth day of illness, until death on December 18

Case 2.—Miss L. B., nurse, age 23 (patient of Dr. Y. Ardom). Became ill on December 24, 1942, with symptoms of general malaise and a headache. She was admitted to the sanatorium on the third day of illness (December 26) with a temperature of 100.8° F. Treatment with sulfathiazole was begun immediately. Temperature, pulse, and respiration are given in figure 7. She complained of severe headache, chills, fever, and profuse perspiration throughout her illness. Nausea and vomiting began on the fourth day of illness and persisted. For an interval of 24 hours on the sixth and seventh days of illness her temperature dropped below 103° F, probably the effect of 50 gr. of quinine given from the fourth through the sixth day of illness following a laboratory report of *Plasmodium malariae* in her blood. An X-ray taken on the tenth day showed a homogeneous density involving the entire lower lobe of the left lung and a mottling suggestive of an early pneumonitis in the base of the right lung. On the tenth day a cough developed, with a thick, mucoid, blood-tinged sputum from the thirteenth day until death. At 7:40 p. m. on the eleventh day, the pulse suddenly became of poor

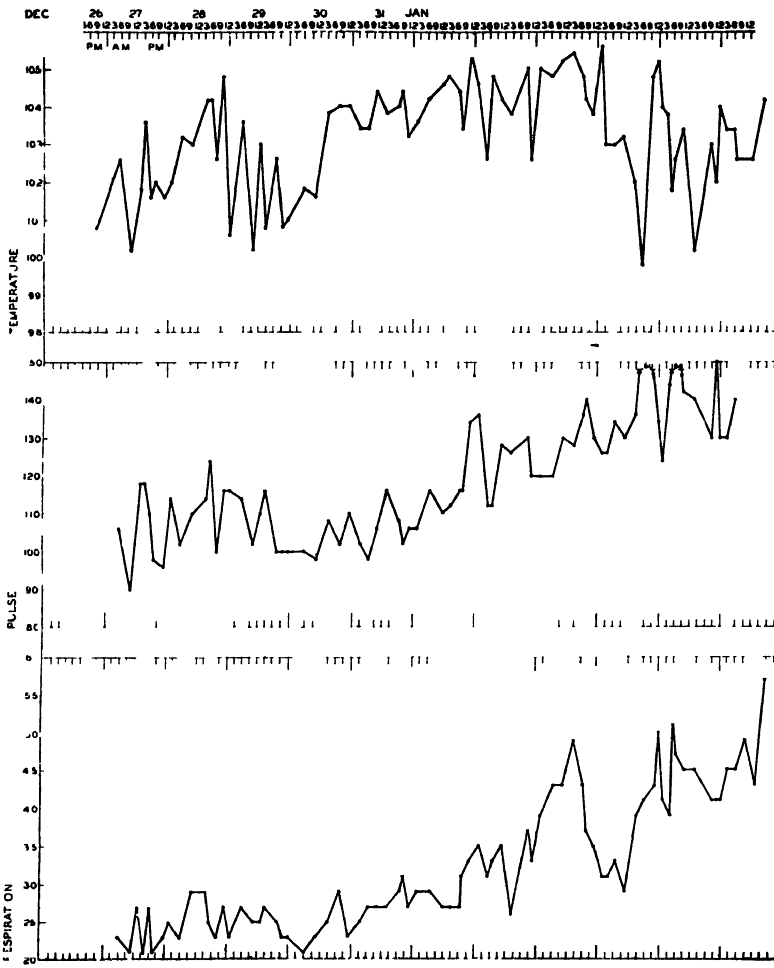

FIGURE 7.—Case 2. Temperature, pulse, and respiration from December 26, 1942, the third day of illness, until death on January 6, 1943.

quality, respiration became shallow and labored, and a marked cyanosis developed. She was placed in an oxygen tent, which partially relieved the respiratory distress. She became comatose during this episode and for the remainder of her illness was delirious, requiring physical restraint in addition to medication with morphine and amytol. At 9:45 p. m. on the last day of illness her pulse became barely perceptible, she expectorated a large quantity of bloody frothy sputum, became deeply cyanotic, and died after 14 days of illness.

Laboratory findings

Date	*White blood cells*	*Red blood cells*	*Hemoglobin (percent)*
Dec. 28, 1942	9, 500	4, 600, 000	85
Jan. 2, 1943	6, 500	4, 300, 000	---
Jan. 4, 1943	10, 800	5, 080, 000	---

Plasmodium malariae.—Reported present in a blood smear on December 12, 1942.

Urine.—Three specimens taken on December 27 and 30, 1942, and on January 3, 1943, were essentially negative.

Therapy:

Sulfathiazole.—A total of 18 gm. of sulfathiazole was given orally from the third through the sixth day of illness. An additional 25 gm. were given from the eighth through the twelfth day.

Sulfapyridine.—Four grams of sulfapyridine were given on the last day.

Aspirin.—Five grains of aspirin were given at approximately 8-hour intervals except on December 26, 1942, January 5, 1943, and January 6, 1943.

Digitalis.—Given intramuscularly every 4 hours the last 2 days of illness.

Case 7.—Miss O., age 23 (patient of Dr. Y. Ardoin). Became ill on January 20, 1943, with severe headache and backache in the lower lumbar region. She was admitted to the sanatorium on that day with a temperature of 101.6° F. She had repeated chills followed by an elevation of temperature and profuse perspiration. Treatment with sulfathiazole was begun immediately, 1 gm. every 4 hours orally. On the second day of illness she became nauseated and vomited. Treatment with codeine and later morphine was without effect. On the fourth day of illness she was given 1,000 cc. of 10 percent glucose intravenously because of the vomiting. This was repeated on the fifth, sixth, and seventh days but the nausea and vomiting persisted. Sulfadiazine was substituted for sulfathiazole on the fourth day; 4 gm. orally were given initially, followed by 1 gm. every 4 hours. On the sixth day of illness a sudden transitory elevation of pulse and respiratory rate occurred with no perceptible clinical change (fig. 8). The following day she complained of chest pain and began to cough, raising a mucoid, bloody sputum. On the eighth day of illness between 1 and 3 p. m. she complained of feeling very weak, became listless, and perspired profusely. Her pulse became weak and of poor volume. She was treated for "collapse" and given digitalis intramuscularly. Her pulse improved about 3 p. m. During this period her temperature dropped to 99° F. and there was a corresponding temporary drop in pulse and respiratory rates, which returned to their previously high levels after this acute episode. Late on the eighth day abdominal distention developed and was treated with enemas and rectal tube. Her condition remained critical. She was seen by a consultant (Dr. K.) at 1 a. m. on the tenth day. At this time her blood pressure was 120/75. Two and one-half grams of sulfadiazine were given intravenously and repeated 18 hours later.

On the afternoon of the tenth day a chest film showed a large area of increased density in the midzone of the right lung field. A fan-shaped density extended from the hilum toward the periphery in the midzone of the left lung field between the second and sixth interspaces. The patient continued raising bloody sputum She was irrational and at times in wild delirium. Respiratory stimulants were used as supportive measures. Early in the twelfth day of illness the patient suddenly became cyanotic. She was placed in an oxygen tent, which gave some temporary relief, but the cyanosis persisted in spite of the oxygen therapy. The patient experienced recurrent episodes in which the pulse became weak and she appeared on the verge of death, her condition improving only temporarily. On the twelfth and thirteenth days of illness she was given 1 unit (250 cc.) of normal plasma each day. In her delirium the patient was constantly picking things out of the air. The temperature began to subside and the pulse rate decreased during the thirteenth day, but there was no particular improvement in respiratory rate. In spite of the change, her general clinical condition at this time was the poorest in her illness.

On the morning of the fourteenth day the patient's condition improved, but by noon it again deteriorated. She received another unit (250 cc.) of blood plasma. There was a marked improvement in both pulse and temperature.

The respiration continued labored and shallow On the fifteenth day the administration of sulfadiazine was discontinued An attempt was made on this day to discontinue the use of the oxygen tent but the respiration then became so labored that its use was continued The patient remained irrational She

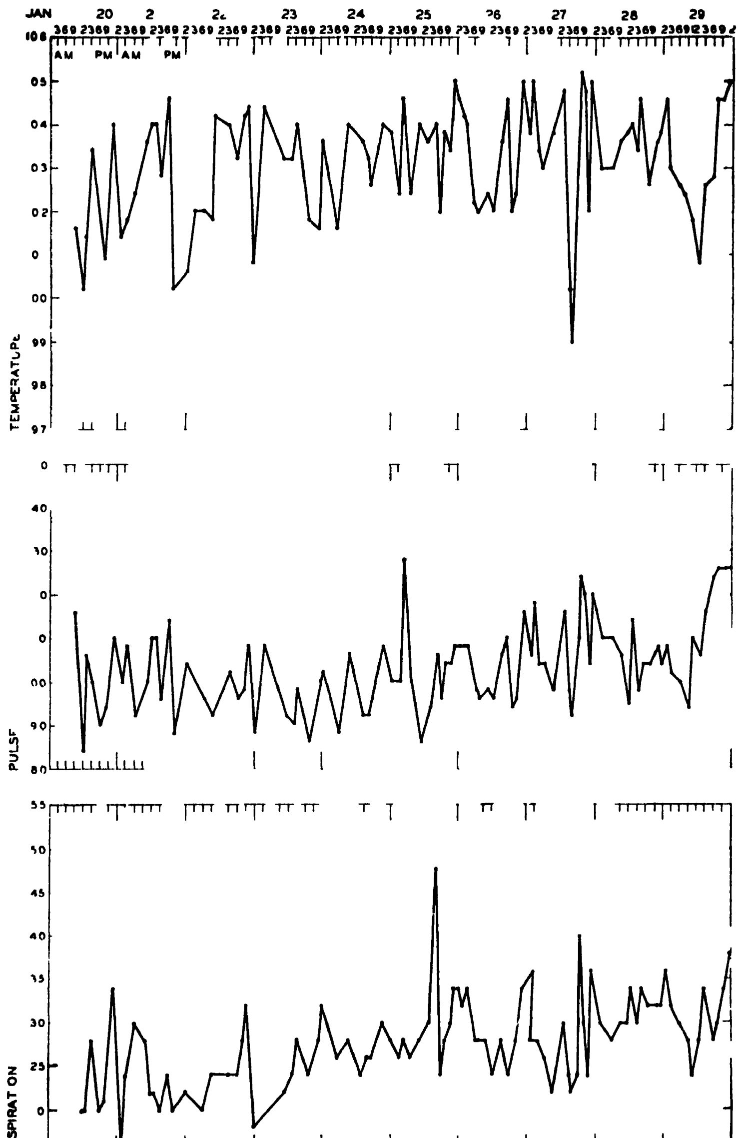

FIGURE 8 Case Temperature pulse and respiration from January 20 1943 the first day of illness until February 8 the twentieth day of illness Temperatures from February 3 to 8 are rectal temperatures

continued to raise a blood-streaked, thick, tenacious sputum Her condition slowly improved between the eighteenth and twenty-third days of illness The fever subsided the pulse rate decreased, and the pulse became of good quality

The slowest improvement was in the respiratory rate, which gradually became lower but could hardly be considered normal until about the twenty-third day of illness. The last elevation of temperature observed was 99.2° F. on February 22, the thirty-third day of illness. She was allowed to get up for the first time on

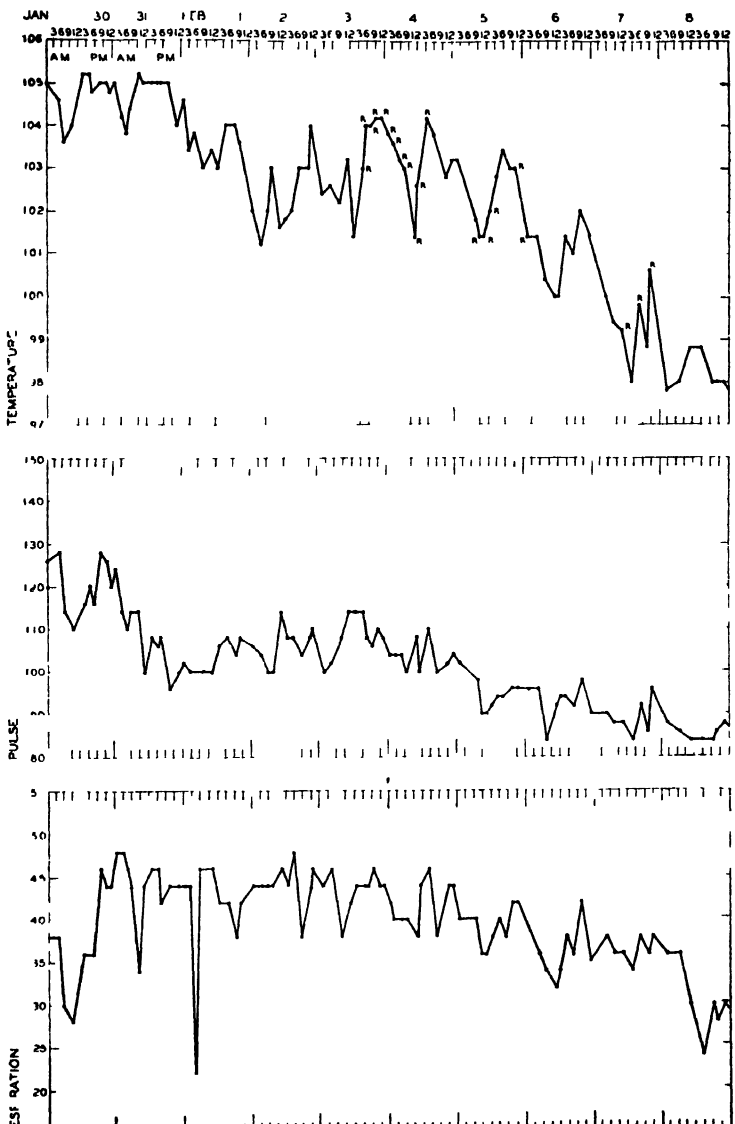

Figure 8 Part 2

February 21, the thirty-second day of illness, and was discharged from the hospital on February 27.

The patient lost 14 pounds during her illness. She did not remember anything about her illness after the first 2 days except the hallucinations during her delirium, which still remained vivid in her mind after 1 year. The patient showed signs

of mental deterioration, becoming very childish for the 2 months following recovery. During this interval she lost her hair, which later grew back. Her mental condition improved, and she became mentally responsible and resumed her work. She still tired easily in the afternoon and was emotionally more unstable than before the illness.

Laboratory findings

Date (1943)	Blood counts: White blood cells	Blood counts: Red blood cells	Urine examinations: Casts	Urine examinations: Red blood cells	Urine examinations: White blood cells	Urine examinations: Sugar	Urine examinations: Albumin
Jan. 21	7, 060	----	Neg.	----	Few	Trace	----
Jan. 23	8, 860	----	Few granular	----	Many	do.	----
Jan. 24	5, 600	5, 550, 000	----	Occ.	do.	do.	----
Jan. 25	5, 840	5, 250, 000	Few granular	----	do.	do	----
Jan. 26	6, 320	4, 950, 000	----	Rare	do.	4+	----
Jan. 27	6, 100	4, 865, 000	----	----	Few	4+	----
Jan. 28	6, 600	4, 250, 000	----	----	Rare	2+	----
Jan. 29	7, 400	4, 775, 000	----	----	Few	4+	----
Jan. 30	7, 700	[2] 4, 750, 000	----	Rare	do.	4+	----
Feb. 1	8, 860	4, 200, 000	----	do.	Occ.	3+	----
Feb. 2	8, 800	4, 275, 000	----	Few	Few	3+	----
Feb. 3	----	----	----	----	----	3+	----
Feb. 4	5, 900	4, 200, 000	----	Rare	Few	2+	----
Feb. 5	[1] 5, 520	4, 400, 000	----	do.	Occ.	2+	----
Feb. 6	4, 900	4, 125, 000	----	do.	Rare	Trace	----
Feb. 7	6, 400	4, 200, 000	----	do.	Few	----	----

[1] Differential on Feb. 5, 1943. Polymorphonuclears, 64 percent, lymphocytes, 30 percent, monocytes, 3 percent, eosinophils, 3 percent—no immature forms.
[2] Urine on Jan 30, 1943—catheterized specimen.

Therapy:

Sulfathiazole: Total of 24 gm. orally given the first 4 days of illness.

Sulfadiazine: Total of 37 gm. orally given from January 24 to February 3, 1943, 5 gm. given intravenously in divided doses on January 29, a total of 42 gm. administered.

Aspirin: A total of 15was gr. per day given on January 20 through January 23, and on January 25. None was given on January 24 nor after January 27.

Intravenous glucose: 1,000 cc. of 5 percent glucose was given each day from January 23 through January 26, with 5 units of insulin.

Case 8.—Mrs. J. S., nurse, age 23 (patient of Dr. Y. Ardoin). Became ill on January 21, 1943, and was admitted to the sanitorium with a temperature of 99° F., complaining of headache, backache, and generalized body aches. Her temperature rose rapidly to 103.8° F., and she began to perspire profusely. Sulfapyridine therapy, 1 gm. orally every 4 hours, was begun on the second day of illness. On the evening of the second day she became nauseated and vomited repeatedly. She had repeated chills, followed by profuse perspiration, and the backache persisted. Sulfapyridine was discontinued on the third day (January 23) and sulfadiazine was substituted—6 gm. in the first 12 hours and then 1 gm. every 4 hours. The nausea and vomiting persisted, despite treatment with codeine, morphine, and glucose intravenously. On the fourth day of illness she developed a cough, which persisted. Her temperature, pulse, and respiration are given in figure 9. Digitalis orally, 1½ gr. every 4 hours, was given from the fourth

to the seventh day of illness On the seventh day her condition became critical, her pulse volume very poor Digitalis was discontinued orally and given intramuscularly She was seen by a consultant (Dr K) at 1 a m on the ninth day, at which time her blood pressure was 104/60 She was given 2 5 gm of sulfadiazine intravenously at 1 30 a m on this day Digitalis was discontinued An X-ray taken on the ninth day showed an area of density in the midzone of the left lung field, the right lung field was clear She became delirious on the tenth day A thick, tenacious, blood-streaked, mucoid sputum was raised Sulfone therapy was begun—1 gm of sulfanilamide or sulfadiazine alternately orally every 8 hours Her condition showed marked improvement beginning on the eleventh day, although her delirium persisted until the twelfth day The fever gradually subsided, reaching normal on the thirtieth day On the thirty-second day of her illness (February 21) she was allowed to get up, but was confined to her room until she was discharged from the hospital on February 27 She recovered after a long, uneventful convalescence

Laboratory findings

Date, 1943	Blood counts: White blood cells	Blood counts: Red blood cells	Urine examinations: Casts	Urine examinations: Red blood cells	Urine examinations: White blood cells	Urine examinations: Sugar	Urine examinations: Albumin
Jan 23	11,400	4,500,000			Many		--
Jan 24	7 600	5,275 000		Rare	do	Trace	-
Jan 25	7,400	5 350,000	Occ		do	do	
Jan 26	7,120	5,000 000	Granular	Rare	do		
Jan 27	7,800	4 300 000			do		
Jan 28	8 260	4,950 000			do		
Jan 29	10 400	4 500 000			do	3 +	
Jan 31	11 800	4 800 000		Occ	do	4 +	
Feb 1	11 600	4,652 000		do	do	2+	-
Feb 2	16 600	4 650,000		do	do		
Feb 4	[illegible] 500	4,950,000			do	2—	
Feb 5	[1] 8 120	5,275 000			do		-
Feb 6	8,320	4,850,000		Rare	do		-
Feb 7	8,200	5,100,000		Occ	do		
			(Catheterized)		Few		

[1] Differential count Polymorphonuclear 59 percent lymphocytes 31 percent monocytes 7 percent eosinophils 2 percent basophils 1 percent

Therapy

Sulfapyridine A total of 8 gm was given orally on the second and third days

Sulfadiazine A total of 43 gm was given orally from the third until the fourteenth day 2 5 gm were given intravenously on the ninth day of illness Total 45 5 gm

Sulfanilamide A total of 10 gm was given orally from the ninth to the thirteenth day of disease

Aspirin 15 gr of aspirin were given orally only on January 22 24, 26, and 27

Intravenous glucose 1,000 cc of 10 percent glucose were given on the following days January 24, 25, 26 and 29

Case 17.– Miss B , age 39, nurse (patient of Dr L Landry) Became ill March 8, 1943, while on duty nursing case 16 Her initial complaint was headache and general malaise The following day chilly sensations in the region of the back and legs, mild low lumbar backache, and a dry, hacking, nonproductive cough developed Her temperature ranged from 99° to 101° F

When seen by the authors on the third day of illness the patient was resting in bed. She did not appear ill, was mentally alert, cooperative, apprehensive over her condition, and eagerly desired to know if she had the same pneumonia as the case she was nursing. Her past medical history revealed nothing significant except pneumonia twice previously and a long-standing bronchial asthma. Musical

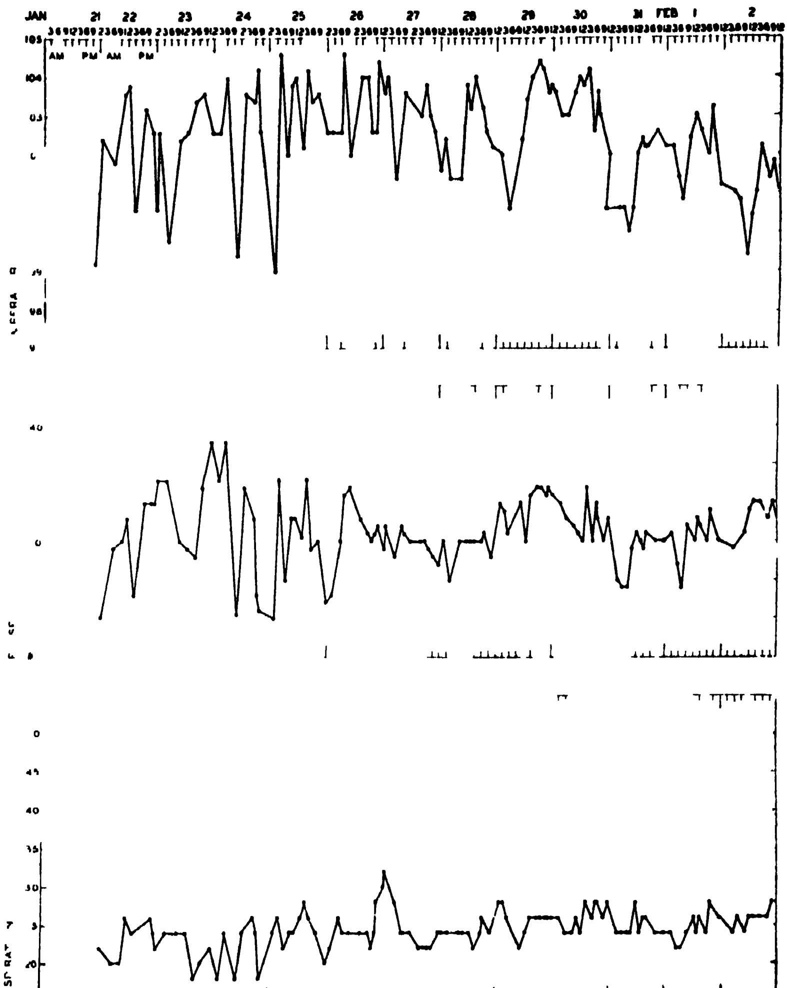

FIGURE 9.—Case 8. Temperature, pulse, and respiration from January 21, 1943, the first day of illness, until February 15, the 26th day of illness.

râles typical of a fairly severe asthma were heard over the entire chest. Over a small area in the right base, showers of faint, high-pitched, crepitant râles were heard at the end of deep inspiration. They disappeared after forced coughing and reappeared only after a period of regular breathing. Respiration was normal in rate, but there was a definite prolongation of the expiratory phase. An X-ray picture revealed a probable area of pneumonitis in the right base. A diagnosis

of pneumonitis and bronchial asthma was made. The patient on learning the diagnosis accepted her condition with equanimity. On the fourth day of illness she first appeared seriously ill. Her temperature was 105° F., pulse rate 116, and respirations rapid (40) and shallow (fig. 10). Cyanosis of the face and lips developed. Oxygen-helium was administered at 15-minute intervals, relieving the cyanosis. This episode of respiratory distress may have been due to an exacerba-

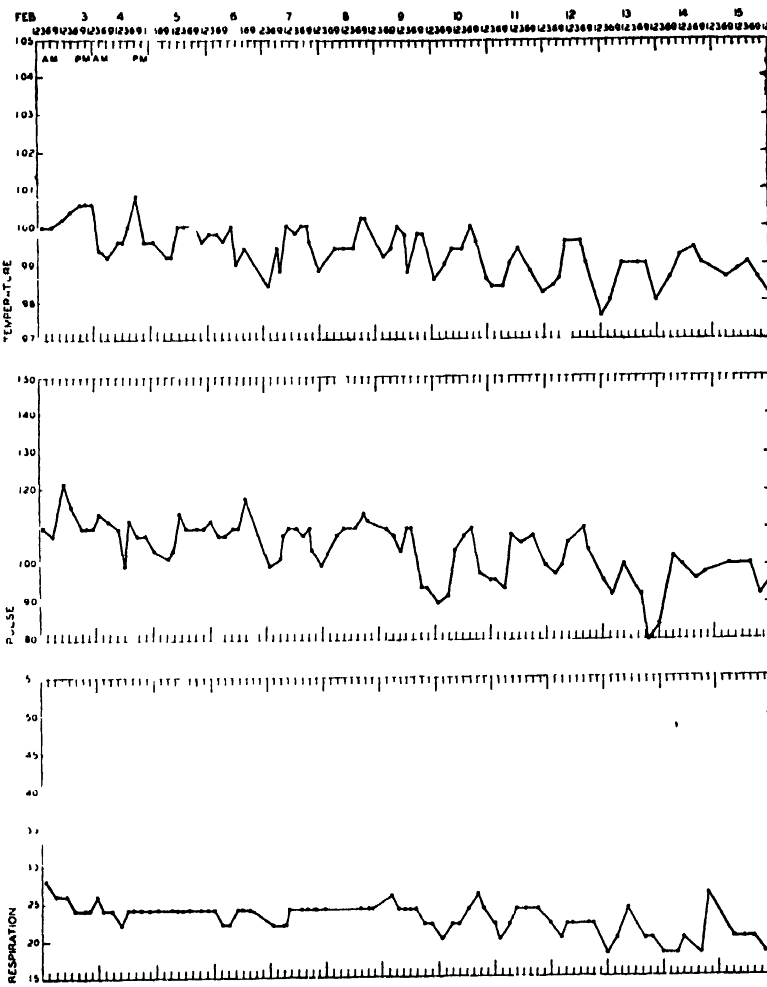

Figure 9 Part 2.

tion of chronic asthma of long duration, as a chest X-ray revealed no important extension of the pneumonitis.

On the fifth day of illness she became irrational. The pulse suddenly increased to 136, with no other clinical change. On the sixth day of illness she was semicomatose; a transfusion of 500 cc. of nonimmune whole blood was given, resulting in temporary, slight improvement. Thick, mucoid, blood-tinged sputum was expectorated for the first time. Abdominal distention developed. Her general con-

dition became progressively worse. Oxygen-helium was administered continuously from the sixth day of illness to death. An X-ray on the seventh day of illness showed that two areas of pneumonitis had now developed in the left lung field. Abdominal distention required constant treatment with enemas, rectal tube, and prostigmine. On the ninth day of illness, 250 cc. of plasma from case 14, convalescent, was given intravenously, followed by 1,000 cc. of 5 percent glucose. Later in the afternoon of this day her pulse rate became very rapid, followed later by a sharply increased respiratory rate. She was treated with coramine, caffeine sodium benzoate, and digitalis intramuscularly. She was in deep coma which persisted until death on the tenth day of illness.

Laboratory findings

Date (1943)	Blood counts: White blood cells	Blood counts: Red blood cells	Urine examinations: Casts	Urine examinations: Albumin
Mar. 10	[1] 11, 700	4, 260, 000		
Mar. 14	[2] 4, 750	4, 330, 000		
Mar. 16			Few granular	2+

[1] Differential count Neutrophils, 79 percent, lymphocytes, 20 percent, basophils, 1 percent.

[2] Differential count· Neutrophils, 40 percent; lymphocytes, 52 percent, monocytes, 3 percent, eosinophils, 5 percent.

Therapy.

Sulfathiazole.—Sulfathiazole was taken by the patient for the first 2 days of illness.

Aspirin.—Aspirin given during illness was not charted.

Case 18.—Miss B., nurse, age 41 (patient of Dr. E. Landry). The first 3 days reported in detail exemplify the mild onset characteristic of the disease:

First day (March 8, 1943): The patient had only a feeling of general malaise. She took her own temperature at 6 p. m., which was 99.2° F.

Second day (March 9, 1943): In the morning on arising she felt a dull pain in the base of her neck. At about 11 a. m. she noticed a dull pain in the lumbar region of the spine. At noon she went to bed. There were no further symptoms, and the patient slept well that night.

Third day (March 10, 1943): the patient was seen by the authors on this day. She had a dull backache and slight pain at the "base of neck" when she turned her head. Her temperature rose to 102° F.

The past history revealed nothing of medical significance except an abdominal operation several years previously. The patient stated she had experienced the same symptoms of general malaise, backache, and low-grade fever 3 years before when she was fatigued from overwork. She was a sturdy, well-developed woman, resting comfortably in bed, mentally alert, and completely cooperative. She did not appear to be ill. Physical examinations revealed significant findings only in the chest; showers of high-pitched crepitant râles were heard in the base of the right lung at the end of deep respiration. These râles disappeared on forced coughing and only reappeared after a period of normal breathing. A tentative diagnosis of pneumonitis in the base of the right lung was made. This was confirmed by X-ray. (X-ray findings are given in detail on page 1332.) Respiration and pulse were not abnormal. There was very little change in the general appearance of the patient from the fourth to the tenth day of illness. Her temperature rose to 105° F. each day except on the seventh day, when it rose to 105.6° F. (fig. 11). There was a gradual increase in respiratory rate. On the sixth day of illness, cyanosis of the lips and fingernails was apparent. She was then placed in an oxygen tent for the remainder of her illness. During this entire interval the patient was mentally alert, cooperative, and cheerful. Beyond the high fever, there was little to suggest that she was seriously ill. On the eighth day she was

given 250 cc. of diluted (50 percent) convalescent plasma from case 11 at 3 p. m. It will be noted from figure 11 that this was soon followed by a marked lowering of her temperature and decreased pulse rate, but the respiratory rate was relatively

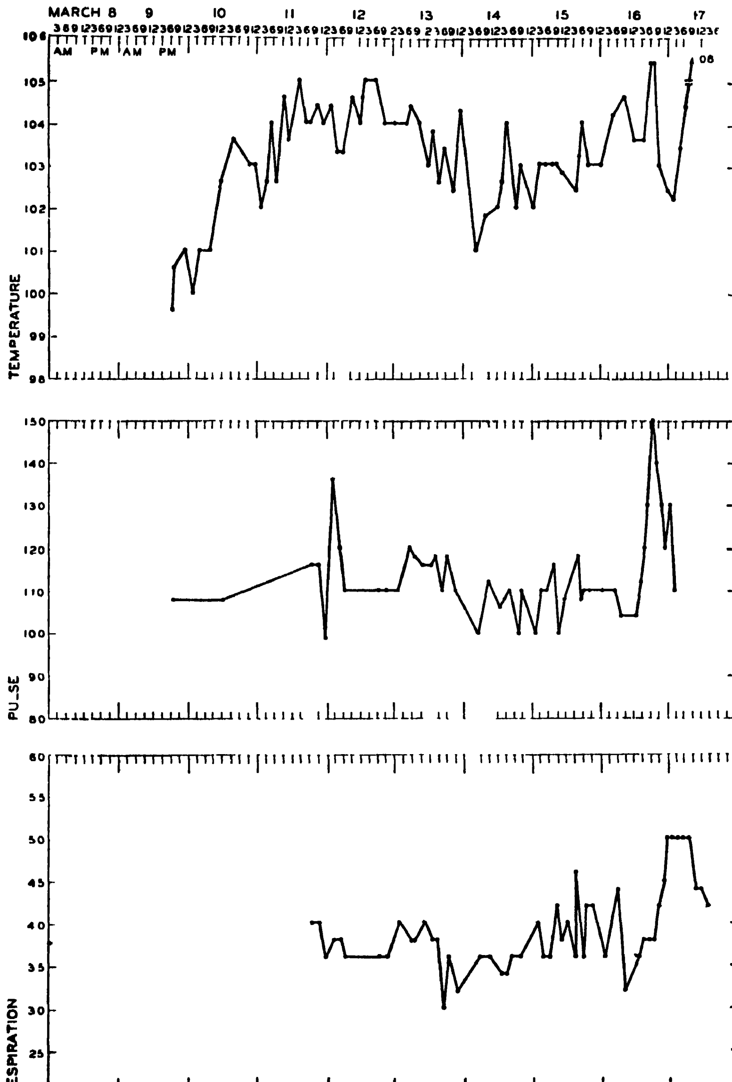

FIGURE 10.—Case 17. Temperature, pulse, and respiration from March 9, 1943, the second day of illness until death on March 17, the tenth day of illness.

unaffected. Digitalization by mouth was begun. This slight improvement was temporary, as her condition thereafter became progressively worse. Respiration became shallow and forced despite oxygen therapy. Digitalis was discontinued when the pulse rate dropped. On the twelfth day a cough productive of foamy,

blood-tinged sputum developed. She became irrational. On this day she was given a whole-blood transfusion with nonimmune blood. Her condition deteriorated, and she expired on the thirteenth day of illness.

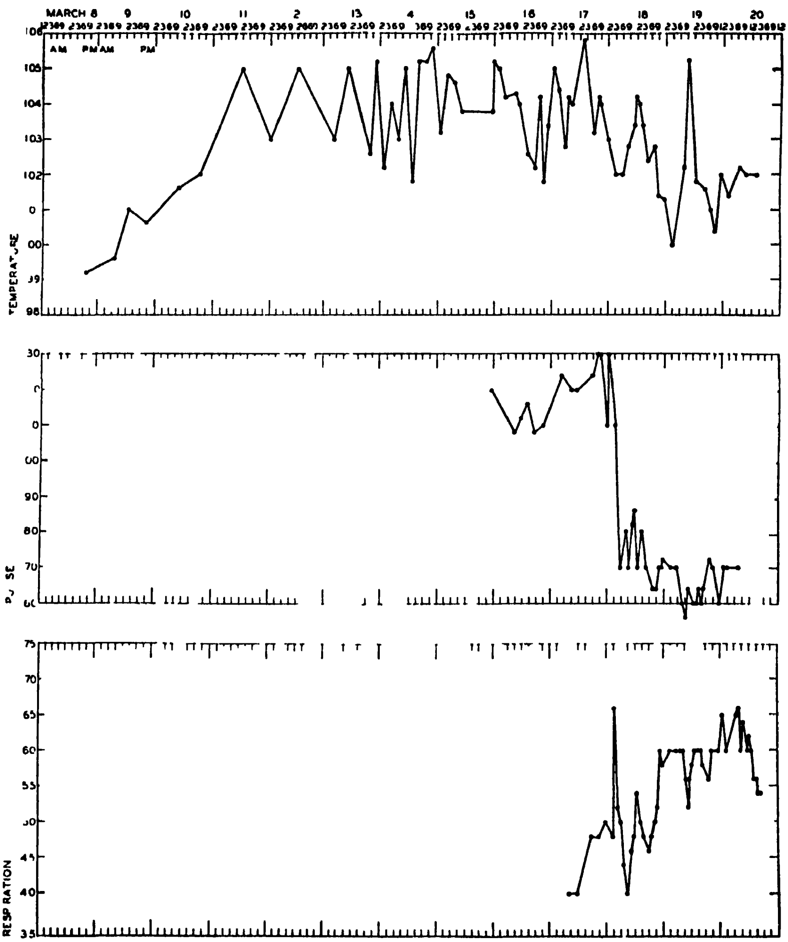

FIGURE 11.—Case 18. Temperature, pulse, and respiration from March 8, 1943, the first day of illness, until death on March 20, the thirteenth day of illness.

Laboratory findings

Date (1943)	Blood counts: White blood cells	Blood counts: Red blood cells	Urine examinations: Hemoglobin (percent)	Urine examinations: Albumin
Mar 10	[1] 8,500	4,250,000	74	------
Mar 14	[2] 4,500	4,450,000	------	------
Mar 15	------	------	------	1+
Mar 19	4,720	4,570,000	72	1+

[1] Differential count: Neutrophils, 74 percent; lymphocytes, 26 percent.

[2] Differential count: Neutrophils, 71 percent; lymphocytes, 21 percent; monocytes, 2 percent; eosinophiles 1 percent.

Therapy

Aspirin.—Small doses of aspirin were taken but not recorded.

Case 19.—Mrs G, nurse, age 28 (patient of Dr E Landry) Became ill on April 1, 1943, with the only symptom a dull pain "between her shoulder blades" Her temperature was not taken The following day she complained of general malaise and chilly sensations and went to bed with a temperature of 101° F A headache and backache which developed late that day were temporarily relieved by aspirin, but these symptoms persisted, as did the chilly sensations She was seen by the authors on the fourth day of illness Her past medical history was negative Physical examination revealed a well-developed and well nourished individual, resting in bed She was very apprehensive and worried about her condition An X-ray of her chest revealed an area of pneumonitis in the right base about 9 by 5 cm in diameter She became emotionally upset when informed of the X-ray findings and became very pessimistic about her chances of survival This acute anxiety state continued throughout her illness This is understandable, as she had nursed two fatal cases She was given 1 unit (250 cc) of normal plasma intravenously this day The following day at 4 p m she was given a transfusion of 500 cc whole blood from case 11, followed by 500 cc saline A severe reaction followed immediately, with chills, hives, and cyanosis This was

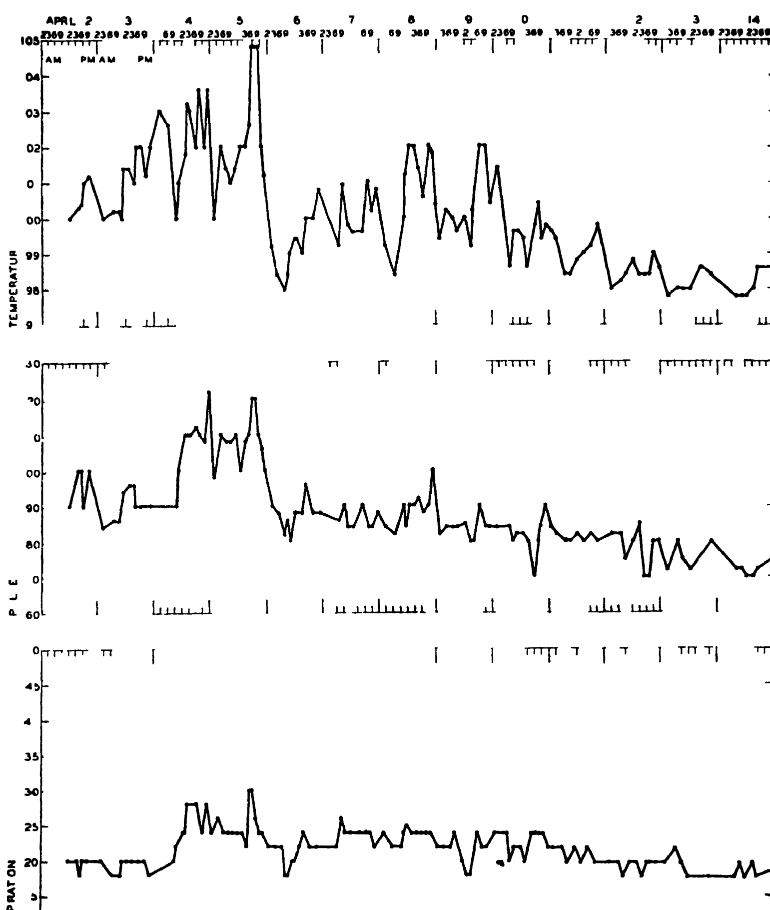

FIGURE 12—Case 19 Temperature pulse and respiration from April 2 1943 the second day of illness until April 14 the fourteenth day of illness

treated with oxygen and adrenalin. At 8:30 p. m. reddish-brown urine was voided. The reaction subsided. On the evening of the fifth day she raised a small amount of rusty sputum. A small ulcer of the buccal mucosa was noted. Her temperature, pulse, and respiration were normal on the morning of the sixth day (fig. 12). This markedly improved her morale and mental attitude. Her only complaint was a headache. On the seventh day the headache became severe, and she complained of chilly sensations. She was given 1 unit (250 cc.) of pooled nonimmune plasma intravenously. On the eighth day she complained bitterly of the severe headache and became lethargic late in the day. She was given 250 cc. of immune plasma from case 12 intravenously. Despite her low fever, she appeared definitely worse; X-ray at this time showed an extension of the pneumonitis in the involved lobe. Because of her lethargy, a spinal puncture was considered but deemed inadvisable. On the ninth day she appeared definitely better. She was given 250 cc. of pooled nonimmune plasma intravenously. This was followed on the tenth day with 250 cc of immune plasma given case 6 She expectorated rusty mucoid sputum again on the tenth day. Her improvement continued, and she became convalescent. For several months after recovery there was a marked change in personality, which in the following year returned to normal.

Laboratory findings

Date (1943)	*Blood counts: White blood cells*	*Blood counts: Red blood cells*	*Urine examination*
Apr. 2	6, 350		Negative
Apr. 7	8, 600	3, 950, 000	

SUMMARY OF CASES

Table 1 gives a summary of characteristic symptoms and physical findings, duration of fever, and outcome of all cases. It is to be noted that no particular symptom or finding has any prognostic value in an individual case. Considering all cases, cyanosis appeared earlier in fatal than in nonfatal cases. Case 4 is questionable on epidemiological grounds, as previously discussed (*1*), and on clinical grounds. The onset, course, and severity of illness and lack of response to therapy was similar to the cases under study; but in the opinion of a competent physician who saw case 4 and also case 6 in the epidemic, case 4 did not represent the same disease.

Death occurred in seven cases between the seventh and the fifteenth days and in one case on the thirty-fourth day of illness. The latter, case 3, appeared to have partially recovered but refused to remain in bed, suffered a relapse, and died. The occurrence of death was not influenced by age but may have been influenced by sex, as discussed on page 1306 of the preceding article (*1*). The three males who contracted the disease died. (Case 4 is excluded.)

TABLE 1 — *Occurrence of certain findings by cases*

Case No	Age	Sex	Headache	Backache	Chills or chilly sensation	Profuse perspiration	Cough [1]	Bloody sputum [1]	Area of pneumonitis by lung fields				Cyanosis [1]	Collapse [1]	Delirium	Coma [1]	Abdominal distension	Day of death	Day afebrile
									Right	Left [1]	Bilateral [1]	Unspecified							
1	48	F	+	+	+	+	13	13			9	+	14	14	0	14	0	15	
2	23	F	+	0	+	+	10	13			10		11	11	+	11	0	14	
3	48	M	+	(2)	+	+	Late	Late				+	(2)	(2)	(2)	(2)	(2)	34	
5	61	F	+	+	+	+	7	7	4		7		7	7	+	0	0	9	
13	68	M	0	0	+	+	5	5	2				7	7	+	5	0	7	
15	26	M	+	+	+	+	1	7	3		7		7	9	+	0	+	9	
17	39	F	+	+	+	+	2	6	3		7		4	6	+	6	0	10	
18	41	F	+	+	+	+	12	12	3		7		6	12	+	13	0	13	
4	62	M	0	+	+	+	Late	Late			+		+	0	+	14 21	0		29
6	22	F	+	+	+	+	8	8			12		31	0	0	0	31		35
7	23	F	+	+	+	+	7	7			10		12	8	+	0	8		33
8	23	F	+	+	+	+	4	10		9			0	7	+	0	0		30
10	36	F	+	+	+	+	3	8				+	+	8	+	0	5		16
11	68	F	+	+	+	+	8	8	8		16		18	8	+	0	0		32
12	66	F	0	0	+	0	(2)		4				7	7	0	12	0		28
14	46	F	+	0	0	+	0	0	5		5		0	0	0	0	0		20
16	19	F	+	+	+	+	1	0	5				0	0	0	0	0		13
19	28	F	+	+	+	+	5	5	4				5	0	0	0	0		14
9	49	F	Patient had typical course. Notes not available.																

[1] Numerals indicate day of illness findings were first noted. + indicates findings occurred. 0 indicates findings did not occur.
[2] Insufficient data.

Only case 16 could be considered mild, case 14 moderately severe. The remainder were severe. The febrile period was from 13 days in case 16 to 35 days in case 6. The latter patient's illness was complicated by pregnancy, and there was a dramatic improvement following miscarriage on the thirty-third day of illness. Convalescence in all cases was prolonged, it was months before complete recovery and return to a state of well-being. Three patients lost their hair between 1 and 3 months after the beginning of convalescence, but it grew back.

Autopsy findings on cases 17 and 18 are reported in a later article (*2*).

CONCLUSIONS

The clinical features of 19 cases (1 questionable) of a severe pneumonitis occurring in the bayou region of Louisiana are described. The onset of disease was mild, with headache and backache, followed by slight chills and concurrent abrupt rise of temperature. Pneumonitis was demonstrable early by physical or X-ray examination, although its presence might not be suspected in view of the characteristic general picture of clinical well-being, which persisted into the second week of illness and terminated abruptly in a state of collapse, often accompanied by delirium or cyanosis, which in some instances recurred at intervals until recovery or proved fatal upon the first occurrence or upon relapse. A characteristic of this disease was the disparity between the extent and severity of findings discovered upon physical examination and the superficial appearance of well-being which the patients exhibited. Eight of the 19 cases terminated in death.

ACKNOWLEDGMENTS

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CONTROL OF *AEDES AEGYPTI* IN SAVANNAH

By C. A. Henderson, M. D., *Commissioner of Health, Savannah-Chatham County Health Department*

In March 1943, an *Aedes aegypti* Control Unit was established by the United States Public Health Service in Savannah, Ga., to operate as a unit of Malaria Control in War Areas, under the immediate jurisdiction of the Savannah-Chatham County Health Department. The unit had as its principal objective the reduction of the population of *Aedes aegypti* mosquitoes in this critical war area, to such an extent that the occurrence of an epidemic of either yellow fever or dengue in Savannah would be very unlikely.

Aedes aegypti, the only known vector of yellow fever and dengue in this country, has been found to be very common in Savannah. During the latter half of July 1943 the inspectional staff of the control unit found that *Aedes aegypti* mosquitoes were breeding on over one-third of the premises in Savannah. The situation was serious indeed, since an *Aedes aegypti* breeding index as low as 1 to 5 percent, i. e., 1 to 5 percent of the premises in a city with active breeding places, is sufficient to permit an outbreak of yellow fever to increase to epidemic proportions.

[1] Deceased.

There was also a real possibility that under present conditions of intercontinental travel yellow fever might be introduced from tropical regions where the disease is endemic. In addition, dengue, known also as breakbone fever, has been common in the United States, epidemics having occurred along the Gulf and South Atlantic Coasts within the last 10 years. If the vector of these diseases be allowed to exist in sufficient numbers in the urban areas of this country, the probability of an outbreak increasing to epidemic proportions must be admitted.

Active immunization is possible against the virus of yellow fever, but, in the case of dengue, no prophylactic vaccine has been developed. It is evident that under present conditions all of the exposed population could not be immunized against yellow fever. The best protection against both yellow fever and dengue is a concerted attack against the vector of these diseases, the *Aedes aegypti* mosquito.

The *Aedes aegypti* Control Unit in Savannah has accomplished much toward the elimination of the breeding places of this mosquito, as shown by the recessive breeding indices since the formation of the Unit. In June 1943, about 14 percent of the inspected premises showed breeding; while in June 1944 the breeding index was less than 2 percent. The rainfall and temperature during and preceding each of these periods were not sufficiently dissimilar to account for an appreciable variation in the breeding index. Inspectors of the unit have made several thorough inspections of every home in the city of Savannah. During such visits all potential or actual breeding places were destroyed; or, in instances where the task was too great for him to handle, the inspector instructed the occupant of the premises how this should be done. A check was made one week later to ascertain if the correction had been made. In most instances full cooperation was obtained. In only a few cases was the health officer obliged to invoke city sanitary ordinances to effect a clean-up.

In the *Aedes aegypti* control work, incidental control of certain other mosquitoes was effected. The breeding places of some *Culex* mosquitoes, certain species of which are vectors of filariasis in certain areas, were destroyed. The suppression of house-pest mosquitoes was accomplished incidental to yellow fever mosquito control, and was of considerable morale value.

The small inspectional force of the Savannah Unit, ranging from 5 to 10 inspectors, was not expected to bring about an immediate appreciable reduction of *Aedes aegypti* breeding. With this small force, the period of time between inspections of individual premises has been approximately 4 months. To control breeding completely by means of inspection alone, it would be necessary to visit premises about every 10 days to coincide with the life cycle of the mosquito.

Realizing that such a small inspectional force would be inadequate, for a city of approximately 150,000 population, the health department used every available means to educate the citizens so that they would apply control measures in their own homes and places of business. Newspapers, radio, movies, and bulletins distributed by the inspectors, were some of the publicity methods employed. Special programs were conducted in the schools. This public education, together with the personal contacts made by the inspectors themselves, has helped tremendously. As a result of the information thus obtained, the population of Savannah has increased its interest in and assistance to the local program. In fact, owing to the educational and inspectional program of the *Aedes aegypti* unit, there has been a decided improvement in general sanitary conditions throughout the city. Reports and complaints from local residents about sanitation problems have decreased during the last year. Removal of containers which would permit *Aedes aegypti* breeding has also caused, indirectly, a clean-up of garbage, rubbish, and debris throughout the city. The general improvement in sanitary conditions alone is well worth the cost of the program.

A permanent *Aedes aegypti* control program is economically sound. Aside from the cost of medical care, the average loss of time from an attack of dengue is about 2 weeks, many cases lasting longer. The partial cessation of business accompanying an epidemic of dengue or yellow fever would seriously handicap the activities of any city. The work of the Savannah Control Unit has indicated the feasibility of practical *Aedes aegypti* mosquito control and it is hoped that this work can be continued after the present emergency has subsided.

DEATHS DURING WEEK ENDED SEPTEMBER 30, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended September 30, 1944	Corresponding week, 1943
Data for 92 large cities of the United States		
Total deaths	7,946	8,441
Average for 3 prior years	8,180	
Total deaths, first 39 weeks of year	349,704	357,184
Deaths, under 1 year of age	602	639
Average for 3 prior years	609	
Deaths under 1 year of age, first 39 weeks of year	23,959	25,825
Data from industrial insurance companies		
Policies in force	66,743,450	65,874,191
Number of death claims	13,221	11,687
Death claims per 1,000 policies in force, annual rate	10.4	9.3
Death claims per 1,000 policies, first 39 weeks of year, annual rate	10.1	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occuring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 7, 1944

Summary

The decline in the incidence of poliomyelitis, although less sharp than in the preceding week, continued through the fifth consecutive week. A total of 877 cases was reported, as compared with 976 last week, 515 for the corresponding week last year, and a 5-year (1939–43) median of 456. Although decreases occurred in all of the 9 geographic divisions of the country except the New England, West North Central, and Pacific, increases were recorded in 9 of the 15 States reporting more than 13 cases each, as follows (last week's figures in parentheses): *Increases*—Pennsylvania 54 (52), Ohio 73 (63), Wisconsin 26 (12), Minnesota 40 (32), Iowa 15 (9), Virginia 30 (23), Kentucky 27 (24), Washington 18 (8), California 23 (18); *decreases*—Massachusetts 20 (22), New York 294 (366), New Jersey 33 (52), Illinois 33 (37), Michigan 23 (46), Maryland 22 (29).

The total for the year to date is 15,424, as compared with 9,824, or 79 percent of the total, for the corresponding period last year. For the same period in 1931 (the year of highest incidence since 1916), 83 percent of the total of 15,745 cases for that year was reported.

A total of 142 cases of meningococcus meningitis was reported, as compared with 127 last week, 191 for the corresponding week last year, and a 5-year median of 29. Increases occurred in all areas except the New England, Middle Atlantic, and East South Central. However, the only States reporting more than 9 cases are California (16), Ohio (15), and New York (12). The cumulative total is 13,998, as compared with 14,714 for the same period last year and a 5-year median of 1,618.

Current incidence of diphtheria, measles, scarlet fever, smallpox, typhoid fever, and whooping cough is below the corresponding 5-year medians; and that of influenza is slightly above the median.

Both current and cumulative figures for typhus fever, 165 and 3,907 cases, respectively, are above the corresponding figures for any prior year.

Deaths recorded in 92 large cities of the United States for the week totaled 8,272, as compared with 7,958 last week and a 3-year (1941–43) average of 8,356. The cumulative total is 358,525, as compared with 366,068 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended October 7, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Oct 7, 1944	Oct 9, 1943		Oct 7, 1944	Oct 9, 1943		Oct 7, 1944	Oct 9, 1943		Oct 7, 1944	Oct 9 1943	
NEW ENGLAND												
Maine	0	1	0		1		1	55	28	0	5	0
New Hampshire	0	0	0				6	4	4	0	0	0
Vermont	0	0	0				0	50	10	0	0	0
Massachusetts	4	3	3				47	50	53	3	14	1
Rhode Island	0	0	0	6			0	1	2	0	2	1
Connecticut	0	0	0	1	5	1	8	3	4	2	8	1
MIDDLE ATLANTIC												
New York	11	9	9	[1] 1	[1] 5	[1] 5	11	92	76	12	29	3
New Jersey	1	2	2	6	4	4	4	100	29	5	14	0
Pennsylvania	4	4	7	2			21	41	60	5	11	2
EAST NORTH CENTRAL												
Ohio	11	11	21	8	1	4	13	90	18	15	5	2
Indiana	5	12	12	1	11	11	1	25	4	5	6	0
Illinois	13	10	10	6	6	4	11	37	19	8	17	2
Michigan [2]	11	6	7			5	20	182	30	9	11	2
Wisconsin	0	4	1	6	25	19	58	148	39	2	3	1
WEST NORTH CENTRAL												
Minnesota	7	9	2				4	182	4	2	1	0
Iowa	2	5	5			1	1	12	6	1	1	0
Missouri	3	1	4	2		1	1	1	1	5	6	0
North Dakota	2	2	2		5	5	0	102	6	0	0	0
South Dakota	2	3	3				1	5	3	0	0	0
Nebraska	0	0	1	4			3	1	10	2	0	0
Kansas	3	1	3		2	3	7	4	4	2	1	1
SOUTH ATLANTIC												
Delaware	0	0	1				0	1	0	0	0	0
Maryland [2]	15	2	3		1	1	0	7	5	7	3	1
District of Columbia	0	0	3	2			1	1	1	0	1	0
Virginia	10	15	36	57	83	83	12	46	19	2	7	2
West Virginia	8	12	10			6	4	5	1	1	1	1
North Carolina	25	48	90	6	12	2	2	20	15	1	1	1
South Carolina	16	25	25	154	189	139	2	28	7	6	1	0
Georgia	21	31	32	87	4	15	2	2	3	1	4	0
Florida	10	5	6		12	2	2	5	2	0	2	0
EAST SOUTH CENTRAL												
Kentucky	4	12	15	1	2	1	2	3	9	1	6	1
Tennessee	5	25	12	5	2	5	6	1	6	1	2	0
Alabama	53	29	20	25	27	12	2	5	5	3	3	1
Mississippi	20	13	23							0	3	1
WEST SOUTH CENTRAL												
Arkansas	7	[illegible]	18	28	22	20	6	3	2	3	0	0
Louisiana	11	4	9	1	3	5	1	17	3	1	2	0
Oklahoma	21	8	12	22	12	17	1	3	3	0	0	0
Texas	72	34	44	580	677	357	25	14	15	7	7	2
MOUNTAIN												
Montana	2	1	2	7	2	2	2	37	12	0	0	0
Idaho	0	0	0	9			2	0	2	1	0	0
Wyoming	4	0	0		8	2	1	25	4	1	1	0
Colorado	8	3	5	5	15	15	7	2	12	1	1	0
New Mexico	5	1	1				0	2	2	0	0	0
Arizona	1	0	1	36	80	46	0	6	6	2	2	0
Utah [2]	0	0	0			1	4	7	5	1	1	0
Nevada	0	0	0	1	1		0	13	0	1	0	0
PACIFIC												
Washington	10	11	4				17	23	23	6	2	1
Oregon	3	1	1	4	24	8	38	21	20	1	1	0
California	19	13	12	7	5	20	114	41	56	16	6	2
Total	409	387	550	1 080	1 246	974	470	1 523	824	142	191	29
40 weeks	8 815	9 450	10 180	343 550	87,071	154 626	594 371	544 415	470 869	13 998	14 714	1 618

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended October 7, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Oct. 7, 1944	Oct. 9, 1943		Oct. 7, 1944	Oct. 9, 1943		Oct. 7, 1944	Oct. 9, 1943		Oct. 7, 1944	Oct. 9, 1943	
NEW ENGLAND												
Maine	2	1	0	13	25	4	0	0	0	1	0	0
New Hampshire	4	0	1	2	18	3	0	0	0	0	1	0
Vermont	2	2	2	6	0	4	0	0	0	0	0	0
Massachusetts	20	10	6	72	164	81	0	0	0	2	4	3
Rhode Island	0	5	0	2	5	3	0	0	0	0	0	0
Connecticut	13	10	2	8	22	13	0	0	0	0	1	3
MIDDLE ATLANTIC												
New York	291	52	52	88	144	101	0	0	0	8	13	11
New Jersey	33	4	10	25	41	38	0	0	0	3	3	3
Pennsylvania	55	7	11	89	102	102	0	0	0	14	16	15
EAST NORTH CENTRAL												
Ohio	73	14	14	142	186	122	0	0	0	4	4	12
Indiana	12	10	3	27	56	44	1	1	1	4	3	3
Illinois	33	91	27	97	79	103	0	1	0	1	5	11
Michigan[2]	23	16	19	65	67	71	0	0	0	4	3	4
Wisconsin	26	14	10	58	129	69	0	1	0	1	1	1
WEST NORTH CENTRAL												
Minnesota	40	22	22	38	61	32	0	0	0	0	0	0
Iowa	15	17	14	30	48	34	0	1	0	0	0	2
Missouri	10	9	7	15	37	36	0	0	0	1	7	9
North Dakota	2	0	1	0	6	6	0	0	0	0	2	1
South Dakota	1	2	2	5	23	12	0	0	0	1	0	0
Nebraska	6	7	5	19	4	9	0	0	0	0	0	0
Kansas	5	23	4	45	66	55	0	0	0	1	0	2
SOUTH ATLANTIC												
Delaware	7	1	1	1	3	4	0	0	0	0	0	0
Maryland[2]	22	2	2	30	16	18	0	0	0	3	2	4
District of Columbia	5	2	1	5	13	13	0	0	0	0	0	1
Virginia	30	0	1	44	22	24	0	0	0	2	4	6
West Virginia	13	1	2	81	77	46	0	1	0	1	6	6
North Carolina	12	2	4	54	122	77	0	0	0	4	2	4
South Carolina	3	0	3	6	15	15	0	0	0	5	9	7
Georgia	3	1	2	21	31	31	0	0	0	16	7	7
Florida	1	0	1	3	4	4	0	0	0	3	1	1
EAST SOUTH CENTRAL												
Kentucky	27	3	6	29	35	35	0	0	0	5	3	11
Tennessee	7	0	2	38	36	54	0	0	0	9	4	6
Alabama	3	0	0	33	23	29	0	0	0	4	0	3
Mississippi	3	1	1	10	10	13	0	0	0	6	7	3
WEST SOUTH CENTRAL												
Arkansas	3	0	2	12	10	10	0	0	0	0	3	9
Louisiana	1	2	1	2	3	3	0	0	0	6	1	6
Oklahoma	1	6	3	13	8	14	0	0	0	2	4	5
Texas	8	15	7	36	31	21	0	0	0	11	9	16
MOUNTAIN												
Montana	0	1	1	10	14	11	0	0	0	0	0	0
Idaho	2	0	0	16	28	9	0	0	0	2	2	1
Wyoming	0	3	0	1	2	3	0	0	0	0	1	0
Colorado	4	15	3	22	11	15	0	0	0	0	0	3
New Mexico	0	3	2	5	5	5	0	0	0	5	5	7
Arizona	2	4	0	5	5	4	0	0	0	4	1	1
Utah[2]	0	24	5	10	12	8	0	0	0	0	6	2
Nevada	0	1	0	0	2	0	0	0	0	0	0	0
PACIFIC												
Washington	18	30	7	29	46	21	0	0	0	0	1	1
Oregon	11	33	2	30	14	14	0	0	0	3	0	0
California	23	49	10	124	113	83	0	0	0	3	9	9
Total	877	515	456	1,536	1,994	1,632	1	5	5	139	144	250
40 weeks	15,424	9,824	6,850	154,498	106,353	106,353	321	635	1,216	4,475	4,496	6,731

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever cases reported separately as follows Massachusetts, 2, New York, 2, Ohio, 1, Michigan, 3, South Carolina, 2, Georgia, 6, Kentucky, 1, Tennessee, 2, Louisiana, 2, Texas, 1, Idaho, 1, California, 1

Telegraphic morbidity reports from State health officers for the week ended October 7, 1944 and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough: Week ended— Oct 7 1944	Whooping cough: Week ended— Oct 9 1943	Whooping cough: Median 1939–43	Week ended Oct 7 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	5	13	13	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	2	0	0	0	0	0	0	0	0	0
Vermont	51	20	20	0	0	0	0	0	0	0	0	0
Massachusetts	76	80	117	0	0	7	0	1	0	0	0	1
Rhode Island	22	14	16	0	0	0	0	0	0	0	0	0
Connecticut	29	16	47	0	1	9	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	150	262	286	0	0	27	0	3	0	0	0	0
New Jersey	54	100	100	0	0	0	0	0	0	0	0	0
Pennsylvania	91	129	204	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	132	160	160	0	0	0	0	1	0	1	2	0
Indiana	6	28	23	0	0	0	0	0	0	0	1	0
Illinois	40	136	182	0	3	0	0	1	0	0	0	0
Michigan [2]	38	136	210	0	1	9	0	1	0	0	0	0
Wisconsin	81	226	151	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	18	48	47	0	2	0	0	0	0	0	0	0
Iowa	33		10	0	0	0	0	0	0	0	0	0
Missouri	12	14	14	0	0	0	0	0	0	0	0	0
North Dakota	13	11	12	0	0	0	0	0	0	0	0	0
South Dakota	9	2	2	0	0	0	0	1	0	0	0	0
Nebraska	8	12	5	0	0	0	0	0	0	0	0	0
Kansas	21	27	2	0	0	3	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	1	0	0	0	0	0	0	0	0	0
Maryland [2]	68	46	[illegible]	0	0	0	0	0	0	0	0	0
District of Columbia	1	[illegible]	14	0	0	0	0	0	0	0	0	0
Virginia	18	44	25	0	0	0	116	0	0	2	0	2
West Virginia	1	46	14	0	0	0	0	0	0	0	0	0
North Carolina	84	70	70	0	0	0	0	0	0	1	0	6
South Carolina	[illegible]	73	23	0	1	9	0	0	0	0	0	10
Georgia	4	3	10	0	0	6	0	0	0	0	0	37
Florida	11	31	7	0	[illegible]	0	0	0	0	0	0	7
EAST SOUTH CENTRAL												
Kentucky	12	54	58	0	0	0	0	0	0	0	0	0
Tennessee	10	30	27	0	0	0	8	0	0	0	0	3
Alabama	12	47	24	0	0	0	0	0	0	0	0	24
Mississippi [2]				0	0	0	0	0	0	0	2	0
WEST SOUTH CENTRAL												
Arkansas	37	19	10	0	3	45	0	0	0	0	0	0
Louisiana	0	0	2	0	2	2	0	0	0	0	0	16
Oklahoma	5	3	4	0	0	0	0	0	0	0	0	0
Texas	159	102	85	0	50	432	21	3	0	0	0	58
MOUNTAIN												
Montana	35	15	8	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0
Wyoming	[illegible]	14	3	0	0	0	0	0	0	0	0	0
Colorado	10	38	30	0	0	0	0	0	0	0	0	0
New Mexico	1	0	8	0	0	3	4	0	0	0	0	0
Arizona	9	15	9	0	0	0	16	0	0	0	0	0
Utah	7	14	14	0	0	0	0	0	0	0	1	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	11	52	23	0	0	0	0	0	0	0	0	0
Oregon	8	28	11	0	0	0	0	0	0	0	0	0
California	78	114	154	0	2	6	0	5	0	0	0	1
Total	1 546	2 306	2 350	0	67	558	165	16	0	4	6	165
Same week 1943	2 306			1	41	253	122	9	2	5	6	123
Same week 1942	2 350			4	45	189	106	16	1	4	9	88
40 weeks 1944	75 109			35	1 368	17 692	7 038	525	23	437	450	3 907
40 weeks 1943	149 965			50	1 675	13 137	6 360	563	21	418	606	3 199
40 weeks 1942	141 736		[4] 143 682	67	921	9 825	5 605	445	37	[4] 438	730	[4] 2 168

[2] Period ended earlier than Saturday

[4] 5 year median 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended September 23, 1944

This table lists the reports from 89 cities of more than 10 000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious cases	Influenza		Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	1		0	1	0	1	3	2	0	0	[illegible]
New Hampshire												
Concord	0	0		0	0	0	1	1	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	2	0		0	22	2	9	7	24	0	1	18
Fall River	0	0		0	0	0	0	0	0	0	0	1
Springfield	0	0		0	0	0	0	4	2	0	0	0
Worcester	0	0		0	0	0	3	2	11	0	0	8
Rhode Island												
Providence	0	0		0	0	0	1	0	5	0	0	11
Connecticut												
Bridgeport	0	0		0	0	1	1	1	0	0	0	0
Hartford	0	0		0	0	0		1	0	0	0	4
New Haven	0	0	1	1	0	0	0	0	0	0	0	6
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		1	0	0	2	31	2	0	0	0
New York	8	0		0	3		36	[illegible]	33	0	4	62
Rochester	0	0		0	2	0	0	[illegible]	0	0	0	6
Syracuse	0	0		0	0	1	2	3	1	0	0	8
New Jersey												
Camden	0	0		0	1	0	0	0	0	0	0	0
Newark	0	0		0	2	0	4	3	6	0	0	17
Trenton	0	0		0	0	0	2	3	0	0	1	0
Pennsylvania												
Philadelphia	0	0		0	[illegible]	3	12	[illegible]	[illegible]	0	4	14
Pittsburgh	0	0	1	1	0	1	10	14	13	0	0	8
Reading	0	0		0	1	0	0	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0	1	0	0	0	0	12	10	0	0	[illegible]
Cleveland	0	0		0	3	1	3	13	12	0	0	24
Columbus	1	0		0	0	0	3	3	4	0	0	14
Indiana												
Fort Wayne	0	0		0	0	0	0	0	2	0	0	0
Indianapolis	4	0		0	2	0	6	7	2	0	0	0
South Bend	0	0		0	0	0	0	0	2	0	0	4
Terre Haute	0	0		0	0	0	1	0	0	0	0	0
Illinois												
Chicago	2	0	1	0	7	6	10	10	[illegible]	0	1	[illegible]
Springfield	0	0		0	0	0	0	0	1	0	0	1
Michigan												
Detroit	3	1		0	3	0	14	22	10	0	1	34
Flint	0	0		0	0	0	2	2	0	0	0	0
Grand Rapids	0	0		0	0	0	1	4	1	0	0	8
Wisconsin												
Kenosha	0	0		0	0	0	0	1	0	0	0	18
Milwaukee	0	0		0	1	3	2	5	1	0	0	32
Racine	0	0		0	0	0	0	0	0	0	0	8
Superior	0	0		0	0	0	0	5	0	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	1	2	1	0	0	2
Minneapolis	11	0		0	3	0	5	17	4	0	0	8
St Paul	1	0		0	0	1	2	7	2	0	0	23

City reports for week ended September 23, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri												
Kansas City	0	0		0	0	0	8	0	3	0	0	0
St Joseph	0	0		0	0	0	0	0	3	0	0	0
St Louis	0	0		0	0	6	6	9	8	0	4	9
Nebraska												
Omaha	1	0		0	0	0	1	1	0	0	0	0
Kansas												
Topeka	0	0		0	1	0	0	0	3	0	0	0
Wichita	0	0		0	0	0	3	0	1	0	0	3
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	0	3	1	0	0	0
Maryland												
Baltimore	7	0		0	0	2	3	7	5	0	0	47
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	2	0		0	1	1	6	14	6	0	0	1
Virginia												
Lynchburg	0	0		0	0	0	1	7	3	0	0	0
Richmond	0	0		0	0	0	1	7	5	0	0	0
Roanoke	0	0		0	0	0	0	2	0	0	0	
West Virginia												
Charleston	0	0		0	0	0	0	0	2	0	0	0
Wheeling	0	0	1	0	0	0	0	1	1	0	0	0
North Carolina												
Raleigh	0	0		0	0	0	1	0	2	0	0	2
Wilmington	2	0		0	0	0	0	0	2	0	0	5
Winston Salem	0	0		0	1	0	0	2	2	0	0	3
South Carolina												
Charleston	1	0	1	0	0	0	0	3	1	0	0	0
Georgia												
Atlanta	1	0		0	1	0	2	0	5	0	2	3
Brunswick	0	0		0	1	0	0	0	0	0	0	0
Savannah	0	0		0	0	0	0	0	0	0	0	1
Florida												
Tampa	1	0		0	0	0	1	0	1	0	2	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	3	0		0	0	0	11	0	1	0	0	7
Nashville	0	0		0	0	1	2	0	0	0	0	1
Alabama												
Birmingham	0	0	4	0	1	0	2	0	2	0	0	1
Mobile	0	0		0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	0	0	0	0	0	0
Louisiana												
New Orleans	1	0	1	0	0	0	6	3	2	0	4	0
Shreveport	2	0		0	0	0	4	2	0	0	1	0
Texas												
Dallas	5	0		0	0	0	3	0	1	0	1	4
Galveston	0	0		0	0	0	0	0	0	0	0	0
Houston	1	0		0	0	1	2	0	2	0	2	0
San Antonio	0	0	1	1	0	0	3	0	0	0	0	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	0	0	0	3
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	10
Missoula	0	0		0	1	0	0	0	0	0	0	0

City reports for week ended September 23, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
MOUNTAIN—continued												
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	1	0		0	0	0	6	1	3	0	0	3
Pueblo	0	0		0	0	0	0	0	1	0	0	1
Utah												
Salt Lake City	0	0		0	3	0	0	0	1	0	0	11
PACIFIC												
Washington												
Seattle	0	0		0	4	1	2	0	2	0	0	3
Spokane	0	0		0	2	1	1	0	3	0	0	0
Tacoma	0	0		0	0	0	0	0	3	0	0	0
California												
Los Angeles	6	0	2	1	10	3	0	2	22	0	0	3
Sacremento	0	0		0	1	0	0	0	1	0	0	0
San Francisco	3	0	1	0	10	2	12	2	3	0	0	2
Total	69	2	15	5	90	44	224	396	276	0	28	526
Corresponding week, 1943	72		34	9	176		239		395	0	22	837
Average, 1939–43	62		40	[1] 10	[2] 154		[1]241		304	1	38	977

[1] 3-year average 1941–43
[2] 5-year median 1939–43

Anthrax Cases Boston, 1
Dysentery, amebic Cases Boston, 2 Chicago, 2 Detroit, 1
Dysentery, bacillary Cases Providence, 1 Buffalo, 33, New York, 5, Rochester, 16, Syracuse, 1, Chicago, 1 Detroit, 13, Charleston, S C, 18, Memphis, 3, Nashville, 3, Shreveport, 1, Los Angeles, 9
Dysentery, unspecified—Cases Richmond, 1, Shreveport, 2
Leprosy Cases New York, 1
Tularemia Cases Shreveport, 1
Typhus fever, endemic Cases New York, 1, Wilmington, N C, 2 Atlanta, 2, Savannah, 6, Birmingham, 2, Mobile, 3, New Orleans, 4, Dallas, 4, Galveston, 4, Houston, 3, San Antonio,

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,366,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5 2	2 6	2 6	2 6	60	7 8	47 1	57 5	115	0	2 6	131
Middle Atlantic	3 7	0	5	9	5	5 6	31 5	91 6	29	0	4 2	53
East North Central	6 1	6	1 2	0	10	6 1	25 5	51 1	37	0	1 2	125
West North Central	26 1	0		0	8	14 1	52 3	72 4	50	0	8 0	91
South Atlantic	22 9	0	3 3	0	7	4 9	24 5	75 2	59	0	6 5	101
East South Central	17 7	0	23 6	0	6	5 9	88 5	0	24	0	0	53
West South Central	25 8	0	5 7	2 9	0	2 9	51 7	14 3	14	0	23 0	11
Mountain	7 9	0		0	32	0	55 6	7 9	40	0	0	222
Pacific	14 2	0	4 7	1 6	43	11 1	23 7	6 3	54	0	0	13
Total	10 5	3	2 3	8	14	6 [illegible]	34 1	60 2	42	0	4 3	80

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 9, 1944.—During the week ended September 9, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		16		15	16	8	4	12	9	80
Diphtheria	4	12		20		5				41
Dysentery (bacillary)				4						4
Encephalitis, infectious						1	1			2
German measles				1	3		2	1	18	25
Influenza		3			12				27	42
Measles				32	34	5	4	4	2	81
Meningitis, meningococcus					4				1	5
Mumps				14	17	1	8	23	11	74
Poliomyelitis		1	12	2	[1] 30	12	1	5	2	[1] 65
Scarlet fever		2	8	42	50	9	4	9	16	140
Tuberculosis (all forms)		2		76	32	8	39	1	40	198
Typhoid and paratyphoid fever				23		1				24
Undulant fever				2	3				1	6
Whooping cough		38		130	64	16	4	22	64	338

[1] Includes 2 cases delayed reports.

CUBA

Habana—Communicable diseases—4 weeks ended September 16, 1944.—During the 4 weeks ended September 16, 1944, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	26	
Dysentery	5	
Leprosy	4	
Malaria	3	
Measles	6	
Tuberculosis	14	4
Typhoid fever	33	3

GERMANY

Infectious diseases—Week ended February 12, 1944, and period January 1 to February 5, 1944—Comparative.—The following numbers of cases of certain infectious diseases were reported in Germany [1] for

[1] Although not stated in the report, it is assumed that the figures are for the old German Reich.

the week ended February 12, 1944, and for the period January 1 to February 5, 1944, compared with the same period of 1943

Disease	Week ended February 12, 1944	January 1–February 5, 1944	Corresponding period 1943
Anthrax	1	3	2
Cerebrospinal meningitis	63	328	265
Diphtheria	6 572	34 820	29 200
Dysentery	24	157	350
Inflammation of the brain	19	84	36
Malaria	3	13	6
Poliomyelitis	15	78	95
Psittacosis		14	1
Ptomaine poisoning	4	121	46
Scarlet fever	6 245	33 912	29,656
Trachoma	258	577	268
Tuberculosis (all forms)	2 894	12 378	12 994
Typhoid fever	171	1 037	2 247
Typhus fever	25	190	642
Undulant fever	2	15	11
Weil's disease	1	3	6
Whooping cough	1 162	6 267	16 228

NEW ZEALAND

Notifiable diseases—4 weeks ended September 9, 1944.—During the 4 weeks ended September 9, 1944, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	21	1	Puerperal fever	5	2
Dengue	1		Scarlet fever	755	2
Diphtheria	7[illegible]	1	Tetanus	1	
Dysentery (bacillary)	[illegible]		Trachoma	3	
Erysipelas	25		Tuberculosis (all forms)	191	59
Food poisoning	2		Typhoid fever	7	
Influenza	2		Undulant fever	2	
Malaria	73				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

China.—Under date of September 21, 1944, 104 cases of plague with 62 deaths were reported in Nanchang, Kiangsi Province, China, since the beginning of the outbreak in August. Plague has also been reported in Wenchow, Chekiang Province, China.

Ecuador—Loja Province—Paltas County.—Plague has been reported in Paltas County, Loja Province, Ecuador, as follows: July 1944, 1 case, 1 death; August 1944, 3 cases, 1 death.

Smallpox

Mexico.—During the month of July 1944, 237 cases of smallpox were reported in Mexico. States reporting the highest incidence are: Durango, 64 cases; Guerrero, 25; Oaxaca, 22; Vera Cruz, 42 cases.

Venezuela. For the month of August 1944, 79 cases of smallpox (alastrim) with 3 deaths were reported in Venezuela, including 56 cases reported in Caracas, and 7 cases each in Falcon State and Miranda State.

Typhus Fever

Colombia—Narino Department—Ipiales.—Typhus fever has been reported in Ipiales, Narino Department, Colombia, as follows: July 1944, 11 cases, 1 death; August 1944, 17 cases, 1 death; September 1–13, 1944, 13 cases, 1 death.

Ecuador.—For the month of July 1944, 33 cases of typhus fever with 8 deaths were reported in Ecuador, including 21 cases, 2 deaths in Quito, and 5 cases with 1 death in Tulcan, Carchi Province. For the month of August 1944, 32 cases of typhus fever with 7 deaths were reported, including 26 cases, 6 deaths in Quito, 3 cases in Tulcan, Carchi Province, and 3 cases in Ibarra, Imbabura Province.

Germany.—For the period January 1 to February 12, 1944, 215 cases of typhus fever were reported in Germany, presumably in the old German Reich.

Guatemala.—For the month of August 1944, 158 cases of typhus fever with 21 deaths were reported in Guatemala. Departments reporting the highest incidence are: Alta Verapaz, 50 cases, 5 deaths; Quezaltenango, 31 cases, 4 deaths; San Marcos, 18 cases, 4 deaths; Totonicapan, 27 cases, 6 deaths.

Hungary.—For the week ended September 2, 1944, 33 cases of typhus fever (including 25 cases in Subcarpathia) were reported in Hungary.

Mexico.—For the month of July 1944, 122 cases of typhus fever were reported in Mexico. States reporting the highest incidence are: Mexico, D. F., 20; Mexico State, 27; Nuevo Leon, 14; Queretaro, 12.

Peru.—For the month of July 1944, 97 cases of typhus fever were reported in Peru, including 28 cases in Cuzco Department, 35 cases in Junin Department, and 13 cases in Puno Department.

Spain.—For the period June 11 to July 22, 1944, 35 cases of typhus fever were reported in Spain.

Yugoslavia.—For the period August 1–14, 1944, 185 cases of typhus fever were reported in Yugoslavia.

Yellow Fever

Venezuela—Tachira State—San Domingo.—Under date of September 16, 1944, it is reported (unofficially) that yellow fever exists in San Domingo, Tachira State, Venezuela, and the surrounding lowlands, but is not yet spreading to Lake Maracaibo district.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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AN EPIDEMIC OF A SEVERE PNEUMONITIS IN THE BAYOU REGION OF LOUISIANA [1]

III. PATHOLOGICAL OBSERVATIONS. REPORT OF AUTOPSY ON TWO CASES WITH A BRIEF COMPARATIVE NOTE ON PSITTACOSIS AND Q FEVER

By CHAPMAN H. BINFORD,[2] *Surgeon, United States Public Health Service*, and GEORGE H. HAUSER, M. D., *Director, Division of Laboratories, Louisiana State Department of Health*

An epidemic of unusually severe pneumonitis with a high mortality rate occurred in southwest Louisiana during the interval December 1942 to May 1943. This is a report of the post-mortem pathology in two cases of the disease, the clinical features of which have been described in the preceding article (*1*). The findings are compared with those seen in psittacosis and Q fever.

Case 17. Miss B, age 39, who died on the 10th day of illness (patient of Dr. E. L. Landry).

The autopsy was begun 5½ hours after death. The body had been kept in a very warm room at the funeral home where the examination was performed. No facilities for weighing organs were available.

External examination revealed an obese white woman. The only skin change noted was a vesicle about 1½ cm in diameter on the lateral surface of the right thigh.

GROSS EXAMINATION

Abdomen.—The peritoneum was smooth and glistening. The liver presented about 5 cm below the costal margin.

Heart. The pericardial fluid was clear and the amount slightly increased. The myocardium was firm and of reddish-brown color. The epicardium, endocardium, and valves appeared normal.

Lungs.—The left pleural cavity contained several hundred cubic centimeters of clear fluid in which a few fibrin threads were seen. The right pleural cavity was dry. There were a number of delicate adhesions uniting the visceral and parietal layers of the pleura.

Left lung: The entire lower lobe and three-fourths of the upper lobe were consolidated. The consolidated areas presented a unique deep purplish plum color.[3]

[1] Presented to the Louisiana Association of Pathologists, December 30, 1943.

[2] Laboratory, U. S. Marine Hospital, New Orleans, La.

[3] The nearest readily available match to this color is that represented on plate 47 J 9, 10, and L 9, 10, p. 117, in A Dictionary of Color—Maerz, A. J., Paul, M. R. New York, McGraw-Hill, 1930.

In the upper lobe there were multiple areas of complete consolidation alternating with and sharply demarcated from entirely normal lung tissue. On section similar sharp demarcation was evident and consolidated areas usually reached the pleural surface. The pattern of this consolidation was entirely different from that usually seen in bronchopneumonia or lobar pneumonia.

The consolidated lung was firm and noncrepitant to palpation, and somewhat less firm and more resilient than liver on section. The cut surface was very dry, the color dark purplish plum, and the bronchi empty.

Right lung: The lower lobe was almost completely replaced by a consolidation similar to that seen in the left lung, but its consistency was not as firm, and little crepitation could be elicited. The middle and upper lobes presented relatively small areas of the same type of consolidation. Again the bronchi were empty.

Tracheobronchial lymph nodes.—There was very little enlargement.

Liver.—There appeared to be slight enlargement. The anterior surface of the right lobe exhibited poorly defined yellowish mottling which extended 2 to 5 mm. into the parenchyma.

Gall bladder.—The organ contained 6 faceted cholesterol stones.

Gastrointestinal tract.—The stomach contained a small amount of reddish-black fluid. In the cardiac mucosa were two small depressions which appeared to be ulcers of recent origin. No lesions were found in the duodenum. On external examination the small and large intestine appeared normal.

Spleen.—The surface was smooth, the size about twice normal, and the deep red pulp so very soft that it was considerably torn in removing the organ from the body. Follicles were not seen.

Uterus.—Of normal size. On the serosal surface there were several firm, white tumors ranging up to 1 cm. in diameter.

Pancreas, kidneys, suprarenal glands, urinary bladder, ovaries, and tubes.—These organs appeared normal.

Cranial cavity.—Very little cerebrospinal fluid was noted. The dura appeared normal. There was an area of subarachnoid hemorrhage 2 or 3 cm. in diameter adjacent to the sagittal suture at the level of the right central sulcus. The leptomeninges appeared normal. The blood vessels of the white matter were prominent. The pituitary gland was of normal size and appearance.

MICROSCOPIC EXAMINATION

Stains used were buffered Romanowsky (*2*) and van Gieson-Weigert iron hematoxylin.

Heart.—Sections of the left ventricle and of the interventricular septum showed a few clusters of mononuclear cells in the epicardium and distributed around the interstitial capillaries and larger vessels within the myocardium. There was a mild degree of fiber hypertrophy.

Aorta.—No lesions were seen. An abdominal periaortic lymph node revealed widening of the sinuses in which large macrophages were observed.

Lung.—Many blocks were studied. There were no significant changes in the pleura.

In the consolidated areas the alveoli were rather uniformly filled by an exudate which varied somewhat in composition from block to block. Most commonly it consisted of many large mononuclear cells, many necrobiotic cells with rounded pyknotic nuclei, some large phagocytic cells with ingested nuclear fragments or an occasional red corpuscle, a few lymphocytes, and many erythrocytes in a matrix of serofibrin. Neutrophils were generally sparse, often absent, and fairly numerous in only occasional microscopic fields. The large mononuclear cells were generally about 15 micra in diameter and exhibited fairly large, leptochromatic, rounded,

FIGURE 1. Case 17. A and B. Lung exhibiting sharply defined areas of consolidation. Van Gieson stain ×3. C. Large bronchus showing stringy mucoid exudate and lack of inflammation in wall. Romanowsky stain ×90

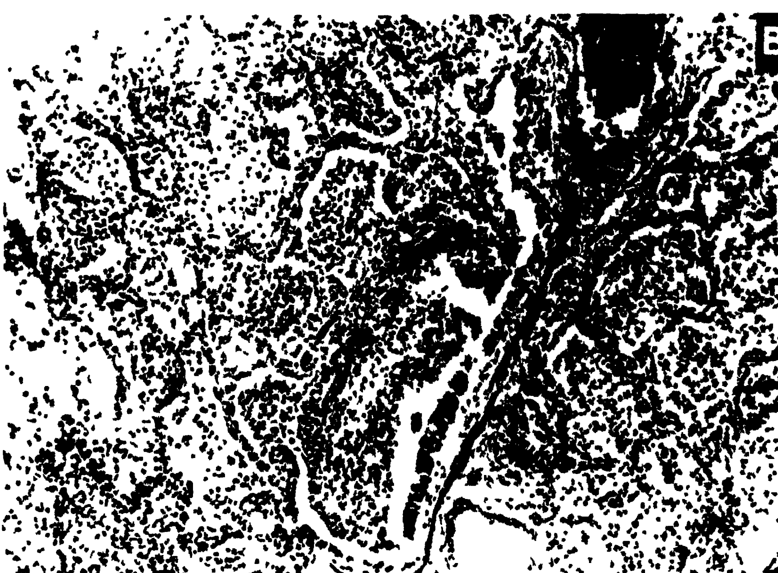

FIGURE 2 Case 17 A Bronchiole and blood vessel in area of pneumonia Thin mucocellular exudate in bronchiole and normal wall Romanowsky stain ×90 B Respiratory bronchiole showing extension of exudate from alveolar side while bronchiolar mucosa is intact Romanowsky stain ×90

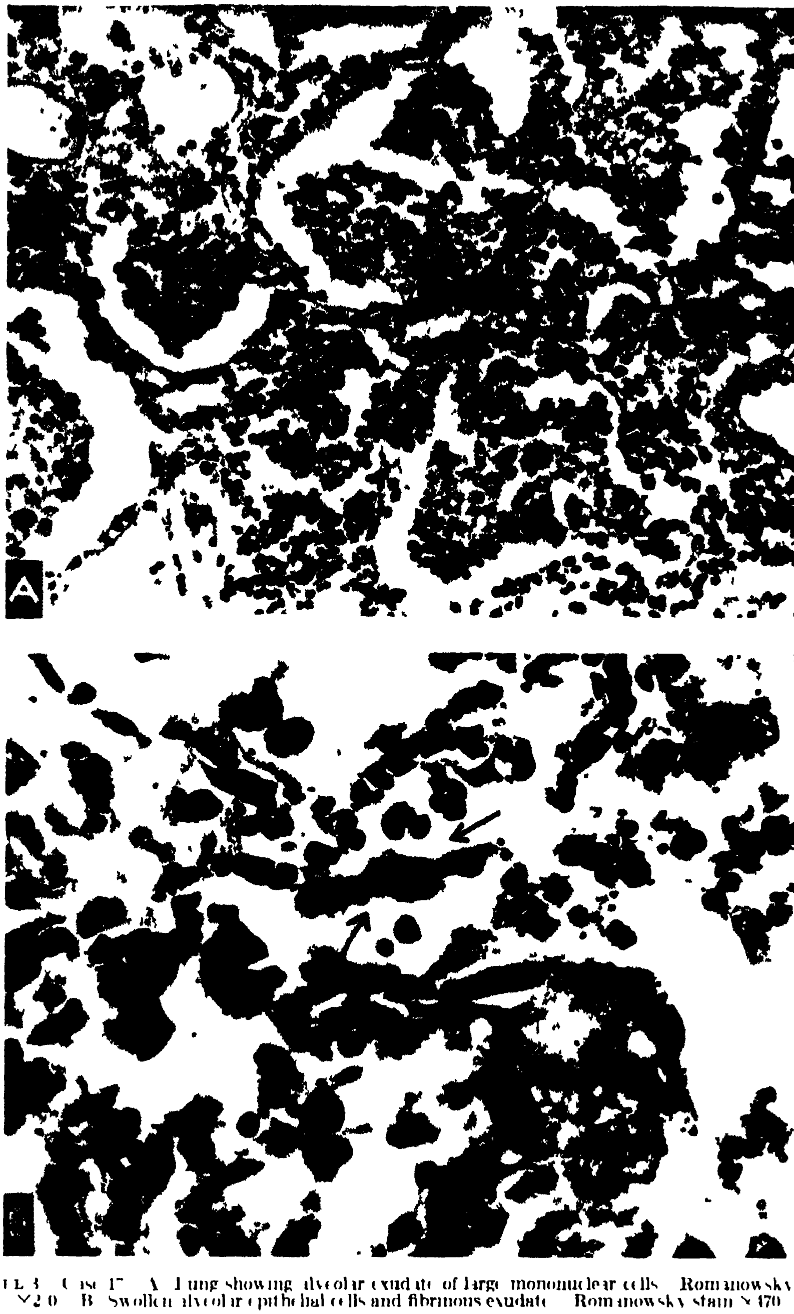

FIGURE 3. Case 17. A. Lung showing alveolar exudate of large mononuclear cells. Romanowsky stain ×2[illegible]0. B. Swollen alveolar epithelial cells and fibrinous exudate. Romanowsky stain ×470.

PLATE IV

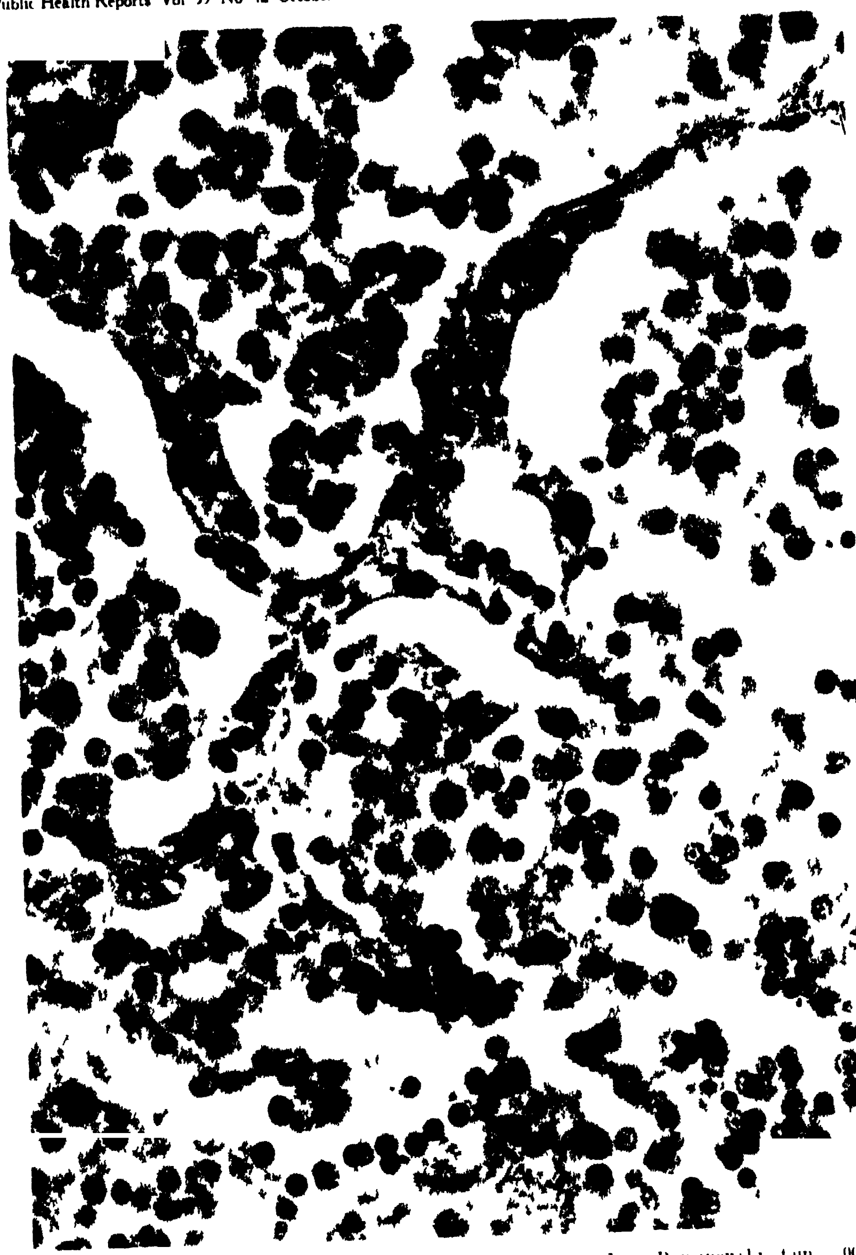

FIGURE 4. Case 17. Large mononuclear cell exudate in pneumonic lung. Romanowsky stain. ×[illegible]00

indented, or lobate nuclei, and wide amphophil cytoplasmic zones A few cells in the alveolar exudate were seen in mitosis

Generally, in the consolidated areas the alveolar lining cells were conspicuous, very large, hyperchromatic, and their cytoplasm widened, finely vacuolated, and often basophilic. Occasional mitotic figures were observed Many desquamated lining cells appeared in the exudate In areas where this hyperplasia was most marked, the alveolar exudate contained much fibrin and relatively few mononuclear cells. The alveolar septa were uniformly congested but showed only small areas of mononuclear cell infiltration In several microscopic fields the septal outlines were lost

The respiratory bronchioles often exhibited the characteristic exudate extending into their lumina from the alveolar side, while their bronchial epithelium remained intact A seromucinous exudate with few leucocytes filled the terminal bronchioles Even in densely consolidated zones their walls and mucosa revealed only slight involvement The epithelium was intact and in areas showed a few emigrating neutrophils The walls were generally only moderately edematous and slightly or moderately infiltrated by mononuclear cells The large bronchioles and bronchi exhibited still less alterations of the same general type

Mild mononuclear cell infiltration was seen around some of the smallest arterioles and venules The larger arterioles and the arteries showed no significant changes Thrombi were seen in a few small arteries and occasionally in capillaries

Several sections included the sharp zones of demarcation between consolidated and nonconsolidated lung Often this line followed the course of an arteriole or venule and in their absence a thin connective tissue septum, but in some areas no dividing structure was seen The septal capillaries in the air-containing areas were moderately congested In sections from areas without obvious consolidation the septal capillaries were engorged and alveoli partly filled with a serosanguinous exudate.

Primary bronchus —The mucosa, submucosa, and wall showed no significant changes

Tracheobronchial lymph nodes There was widening of the peripheral and some of the pulp sinuses The latter were filled with mononuclear cells Follicles were hypoplastic

Liver —The sinusoids were congested, especially in the centrolobular zone. The Kupffer cells showed considerable swelling and much phagocytosis of lymphocytes and erythrocytes The sinusoids contained mononuclear cells, some of which had ingested erythrocytes, and serum. Rarely a few of the periportal parenchymal cells were finely vacuolated

Spleen The follicles were very small The entire pulp showed intense infiltration by lymphocytes, plasma cells, and large phagocytic cells with pale, oval nuclei and foamy cytoplasm Erythrocytes were mixed with this infiltrate in considerable numbers Much blood pigment was present Neutrophils were few and played no conspicuous part in this reaction The sinus architecture was practically obliterated by this intense infiltration, but where perceptible, the lining reticulo-endothelial cells were swollen

Stomach —A section taken near the cardiac sphincter showed a small ulcer with overhanging edges The base exhibited a few coagulated, vaguely perceptible, mucosal glands and capillaries filled with tiny thrombi Other parts of the gastric mucosa showed no changes

Kidney —The glomerular capillaries were congested Some capsules contained little granular acidophilic exudate The convoluted tubules were lined by swollen epithelial cells with acidophilic granular cytoplasm These tubules frequently contained a little albuminous exudate

Rectus muscle —Striations were lost in most of the fibers and partly or completely lost in others Sarcoplasm was swollen, opaque, and eosinophilic, and interstitial nuclei prominently increased

Bone marrow, vertebral —The marrow was cellular No changes were noted

Brain —Numerous sections of cerebellum, cerebral cortex, corpus striatum, thalamus, pons, and medulla were studied The hemorrhagic areas described in the gross protocol was limited to the leptomeninges and appeared to be of very recent origin The white matter of the cerebral cortex and brain stem revealed minute perivascular areas of hemorrhage and a few small sharply circumscribed zones of demyelinization in which the ground substance stained poorly and was finely vacuolated The dura and choroid plexus showed no lesions The pituitary appeared normal

Sections of pancreas, small intestines colon, suprarenal, pituitary, urinary bladder, ovary, and uterus appeared normal, with the exception of the leiomyomata in the last named

Bacteriology —At the autopsy table cultures were made of lungs, heart blood, liver, spleen meninges, and brain on blood agar and in thioglycollate broth No pathogenic bacteria were recovered Smears made of the same organs revealed no bacteria Sections of pneumonic lung and spleen were stained for bacteria by Gram's method, toluidine blue, Giemsa's method, and Steiner's silver method No bacteria were identified

Pneumonic lung sections stained by the Romanowsky method were studied carefully using a 2-mm oil immersion objective After prolonged search several of the alveolar lining cells and a few free cells of a type with elongated leptochromatic nuclei presented in their cytoplasm clusters of delicate minute coccobacillary bodies which stained a deep purplish blue Often the coccobacillary forms exhibited bipolar basophil granules and a faintly outlined pale blue connecting central part In the liver a single Kupffer cell was found with similar bodies Spleen sections showed none

SUMMARY OF CASE 17

A firm pneumonic consolidation characterized by a deep purplish plum color and sharp lines of demarcation separating it from nonpneumonic lung [3] almost completely replaced the left lung and the right lower lobe, while the middle and right upper lobes were partially involved Microscopically a compact sero-sanguino-fibrino cellular exudate filled the alveoli Large mononuclear cells predominated Neutrophils were conspicuously few Alveolar lining cells were hyperplastic Septa were congested, and in areas very little widened The exudate extended into the respiratory bronchioles but only slightly affected the other bronchioles, and the bronchi were normal

Related changes in other organs were swelling of Kupffer cells and large mononuclear cell accumulation in liver sinusoids, acute splenitis, two small recent ulcers in cardiac portion of stomach, acute hyalin necrosis of rectus muscle, a small subarachnoid hemorrhage, and petechial hemorrhages and anoxic necrosis of brain

Nonrelated abnormalities were cholelithiasis and small uterine leiomyomata

No bacteria were demonstrated in smears or tissue sections No pathogenic bacteria were obtained on culture

In a few alveolar lining cells and in a few free cells in the alveolar exudate clusters of basophil, cytoplasmic, minute coccobacillary inclusions were found Similar inclusions were seen in one Kupffer cell in the liver

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[3] It is probable that the anatomic basis for the peculiar, sharply demarcated pattern of consolidation seen in this case and in case 18 is the "secondary" pulmonary lobule which is described and illustrated by Miller in his monograph (Miller, W S The Lung Charles C Thomas Co , Baltimore, 1937)

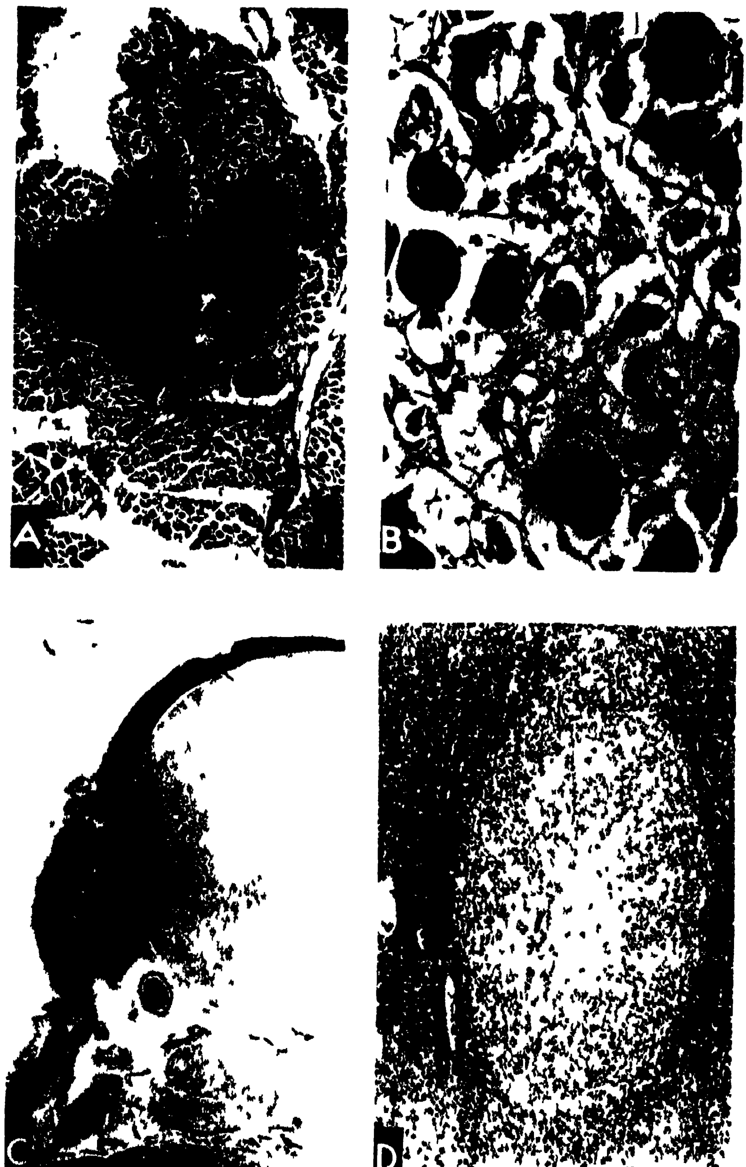

FIGURE — A Case 18 Hemorrhage in rectus muscle van Gieson stain ×80 B Case 18 Degeneration in rectus muscle van Gieson stain ×150 C Case 17 Area of subarachnoid hemorrhage Romanowsky stain ×98 D Case 17 Brain showing petechial hemorrhage and necrosis van Gieson stain ×145

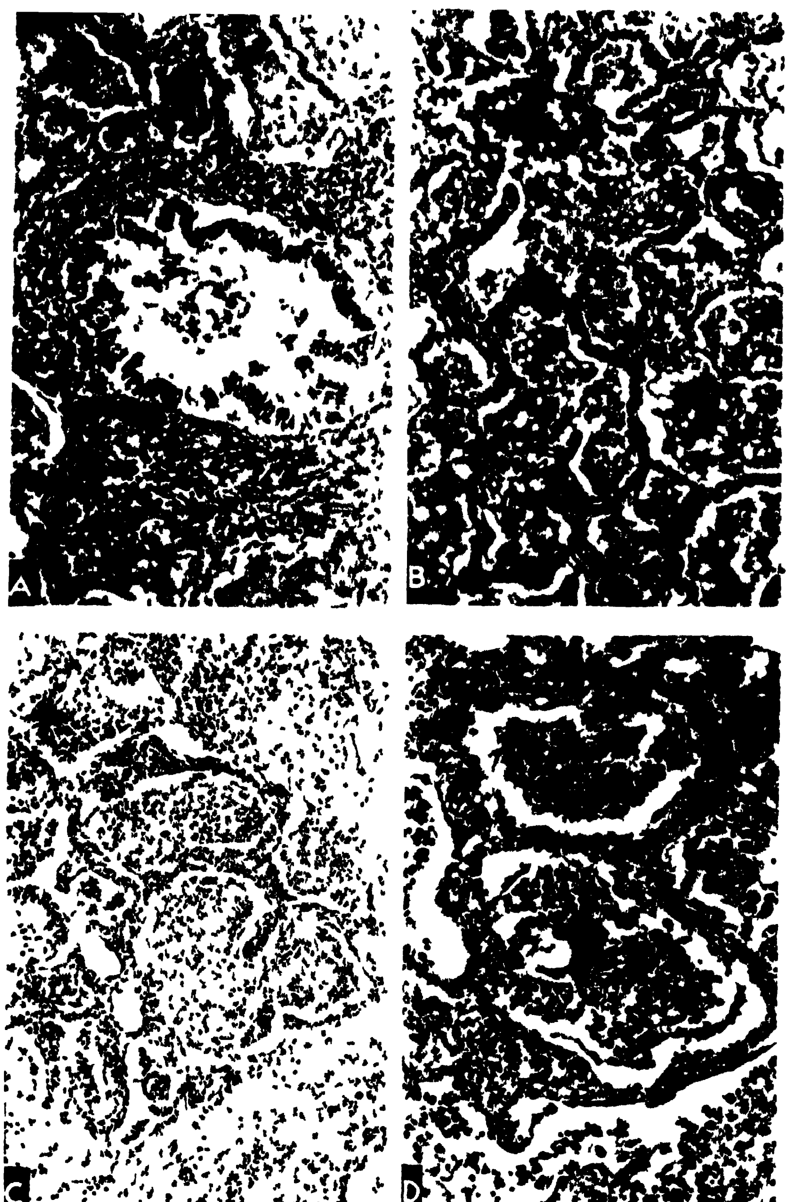

FIGURE 6.—Case 18. A, Relatively uninvolved bronchiole in pneumonic lung, van Gieson stain ×60. B, Serocellular exudate in alveoli, van Gieson stain ×60. C, Area of pneumonia with large mononuclear cell exudate, van Gieson stain ×60. D, Same as C ×120.

Case 18. —Miss B , age 41, who died on the 13th day of illness (patient of Dr. E L. Landry) Autopsy was begun 10 hours after death and, with the exception that some refrigeration had been effected by placing ice about the body, the same conditions existed as in the previous case External examination revealed a small white woman No lesions of the skin and no jaundice were present.

GROSS EXAMINATION

Abdomen —The right rectus muscle exhibited a hemorrhage approximately 10 by 5 by 1 cm. In the left rectus was a similar but smaller hemorrhage The liver edge was about 5 cm below the costal margin

Thorax —About 400 cc of clear fluid were in the left pleural cavity and a slightly smaller amount in the right

Heart —There was a slightly increased amount of clear pericardial fluid The right side of the heart was moderately dilated The pericardium, myocardium, and valves were normal

Lungs —The four major lobes presented varying amounts of consolidation estimated as follows Right lower, 90 percent, right upper, 75 percent, left upper, 75 percent and left lower, 50 percent The middle lobe was apparently uninvolved The color of the consolidated areas was the same deep purplish plum which was mentioned before The involved and uninvolved parenchyma were likewise delineated by clear-cut sharp lines of demarcation The pleural surfaces were negative except for a very small area (1 cm) of fibrinous exudate on the surface of the right lower lobe The consistency of the consolidated areas was firm and again somewhat resembled that of liver but was more resilient.

The cut surfaces were wet, and considerable serosanguinous exudate was obtained on scraping The color was uniformly the same deep purplish plum. The lines of demarcation between the involved and uninvolved portions followed the patterns above described The bronchi contained small amounts of thin brownish fluid There was very little enlargement of the tracheobronchial lymph nodes.

Liver The surface presented a diffuse mild, subcapsular, hemorrhagic mottling On section the cut surface had a smooth and homogeneous appearance. The gall bladder was normal

Spleen —The organ was about twice the normal size The capsule was smooth. On section the consistency was firm and the cut surface was even with or slightly elevated above the capsule The follicles were not easily distinguished The pulp had a dark, reddish purple color

Kidneys —Estimated weight of each 175 gm The capsules stripped easily, leaving a smooth, gray surface The cortex and medulla were sharply demarcated, the medulla was congested The cortex was pale gray and somewhat swollen The pelves and ureters appeared normal

Gastrointestinal tract —No distinct lesions were noted in the stomach and duodenum On inspection and palpation the remainder of the intestinal tract was normal The appendix was absent

Pancreas The size was normal In the body a calculus 8 mm in diameter was found occluding the pancreatic duct, but no necrosis was present The suprarenal glands, abdominal periaortic lymph nodes, urinary bladder, ovaries, tubes, and thyroid were apparently normal There were several fibroid tumors in the uterus

Cranial cavity—brain —The subarachnoid fluid appeared to be somewhat increased in amount The brain was placed in 4 percent formaldehyde and dissected after hardening No lesions were seen on multiple coronal sections The pituitary was normal in size and appearance

MICROSCOPIC EXAMINATION

The same stains were used as in case 17.

Heart.—In the epicardium there was mild lymphocyte and plasma cell infiltration. The myocardium of both ventricles presented interstitial edema and mild to moderately severe lymphocyte and plasma cell infiltration which was increased about the small blood vessels. There was a tendency for the infiltrating cells to be grouped about the small blood vessels.

Aorta.—No lesions.

Lungs.—Sections made through many of the consolidated areas presented in general a fairly uniform picture which varied little from that seen in the previous case. There was a fibrinocellular or serocellular exudate filling the alveoli. The cellular composition of the exudate was predominantly of a nonpolymorphonuclear-cell type. Erythrocytes were present in fairly large numbers. Large mononuclear cells again predominated. Characteristically they presented rounded, lobate, or kidney-shaped, excentrically placed, leptochromatic nuclei and broad amphophil cytoplasm. Some macrophages contained phagocytozed particles of nuclei and carbon. There was little erythrophagia. In many large round cells the nuclei were pyknotic and fragmented. Occasional cells in the exudate were undergoing mitotic division. Neutrophils, though generally rare, in a very few fields were moderately numerous. A few lymphocytes were present also.

The alveolar lining cells were large and conspicuous, their nuclei large, frequently rounded and deeply stained, and their elongated cytoplasm vacuolated. A few cells were undergoing mitotic division. Desquamation was common, and the cells formed a small part of the alveolar exudate. Though obliterated in a few small areas, the interalveolar septa generally were easily distinguished, moderately widened, and usually congested. They contained a medium number of mononuclear cells. In some fields acidophil thrombi were easily discernible in the lumina of the capillaries.

The respiratory bronchioles often showed an extension of the alveolar exudate into their lumina, while the bronchial mucosa remained intact and essentially unchanged. Terminal and larger bronchioles contained mucinous exudate with few leucocytes. Their walls were moderately edematous and only slightly infiltrated by lymphocytes and plasma cells and occasional neutrophils.

Small blood vessels were sometimes surrounded by lymphocytes. In several of the medium-sized arteries the lumina were partly filled by compact thrombi which usually were adherent to the intima. The walls of the larger arteries revealed no inflammatory reaction. In a few sections small, sharply defined areas revealed early coagulation necrosis of the septa and blood-filled alveoli.

In several of the lung blocks some air-containing parenchyma was present, and in one block, with the exception of a little serous exudate, it appeared to be entirely normal. The pleura exhibited no abnormality.

Primary bronchus.—No lesions.

Tracheobronchial lymph node.—Follicles were inactive. Dilated peripheral and pulp sinuses were filled with mononuclear cells.

Liver.—Immediately beneath the capsule were foci measuring up to 0.2 mm. in diameter which exhibited vacuolated oxyphilic coagulated liver cells and partly clotted blood in the dilated sinusoids. Deeper in the block but not over 5 mm. from the capsule an occasional centrolobular fibrino-mononuclear-cell thrombus was observed in the sinusoids. Throughout the sections there was enlargement, vacuolization, and marked phagocytic activity in Kupffer cells. In the sinusoids also were medium numbers of large, round phagocytic cells and large mononuclear cells. A few lymphocytes were also present, but neutrophils were only rarely noted.

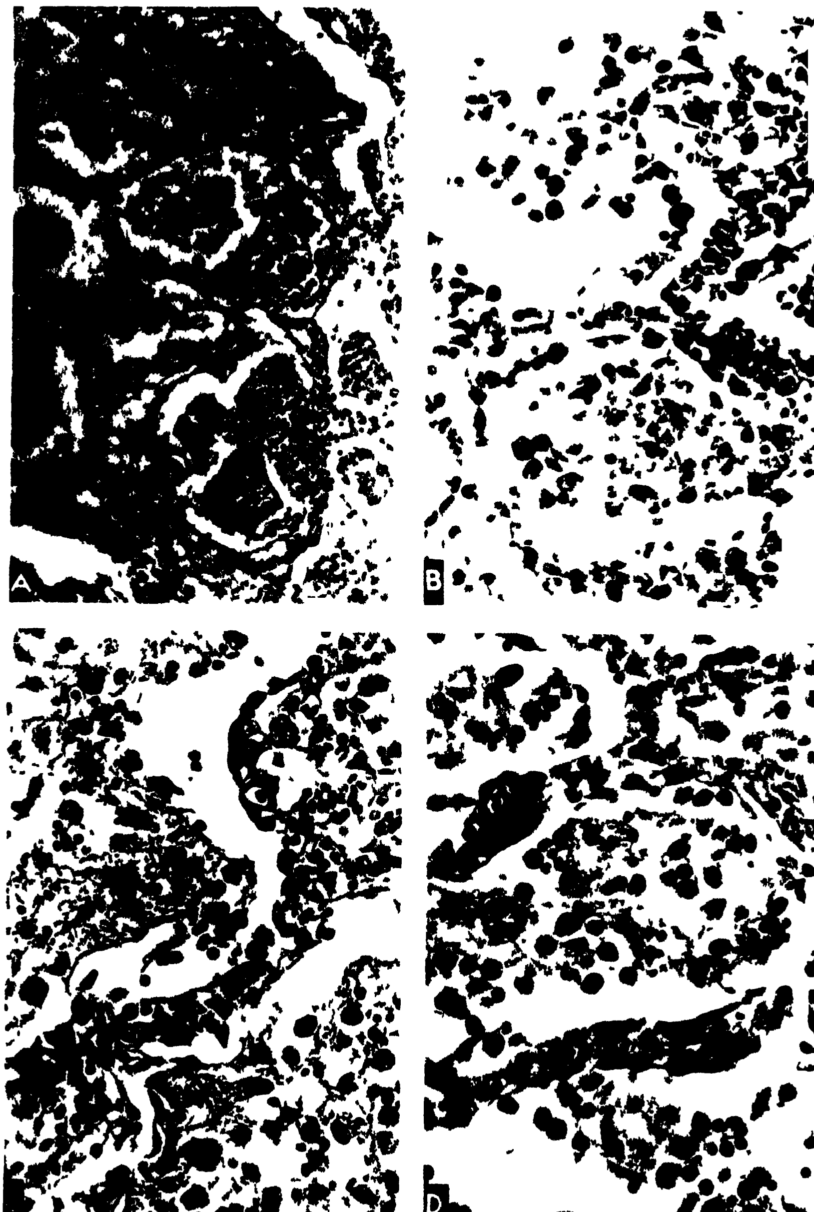

FIGURE 7.—Case 18. A. Lung with fibrinocellular exudate. Romanowsky stain ×120. B. Lung. Note swelling of alveolar lining cells. Van Gieson stain ×300. C. Lung showing large mononuclear cell alveolar exudate and slightly widened septa. Van Gieson stain ×300. D. Another area of pneumonia. Note swollen alveolar lining cells. Van Gieson stain ×300.

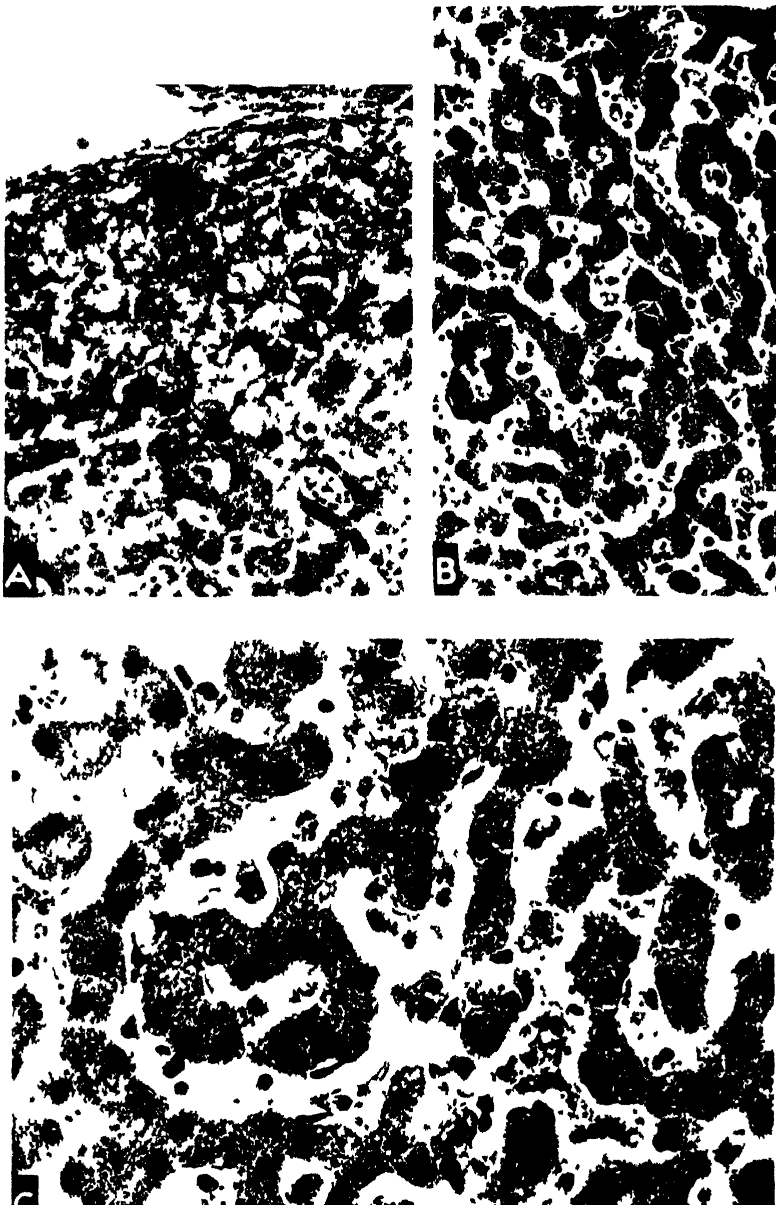

FIGURE 8 Case 18 A Liver Subcapsular necrosis Romanowsky stain ×160 B Liver non necrotic part van Gieson stain ×160 C Liver, van Gieson stain ×4 0

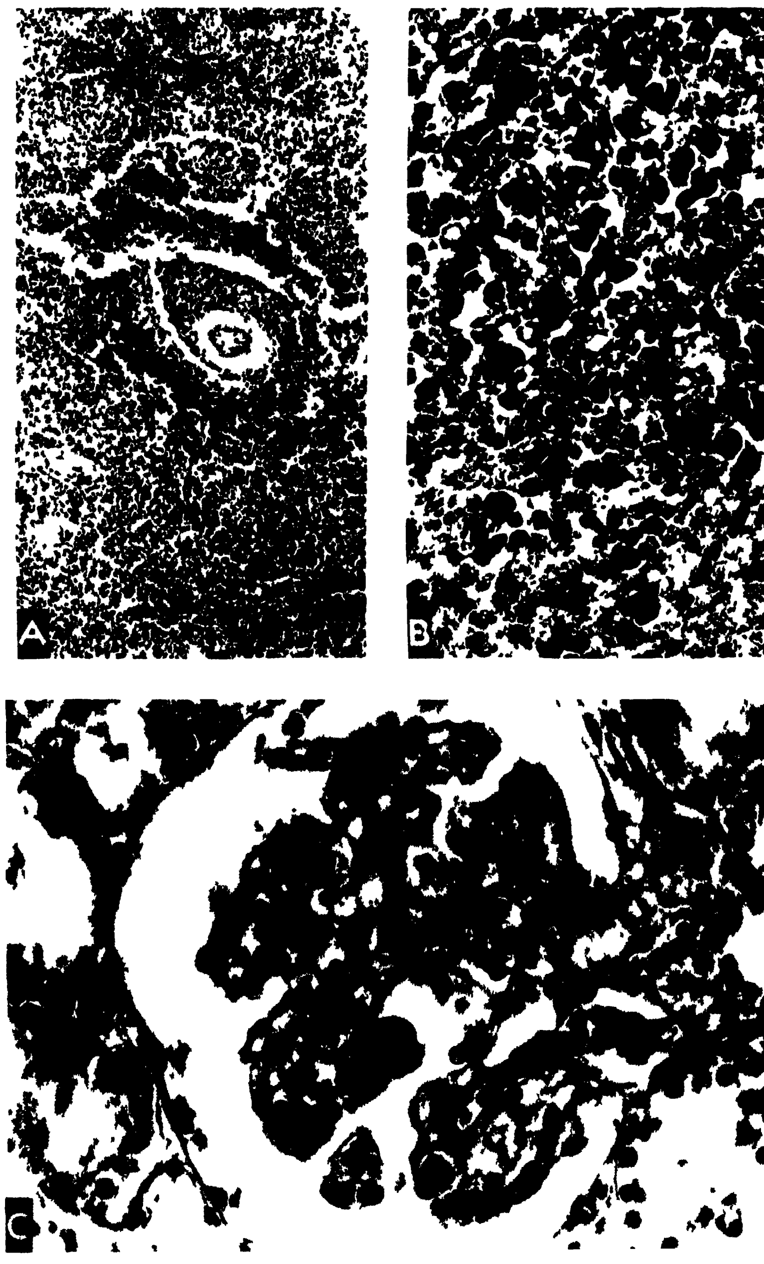

FIGURE 9 A Case 17 Spleen Romanowsky stain ×100 B Case 18 Spleen van Gieson stain ×450
C Case 18 Kidney, thrombi in glomerular capillaries, van Gieson stain ×150

FIGURE 10. Case 1. A, Intracellular cluster of minute basophilic bodies in pneumonic exudate. Romanowsky stain ×1,000. B, Same as A, greatly enlarged.

Spleen.—Follicles were small and were rimmed by a narrow zone of pale-stained large mononuclear cells. The sinuses were engorged and pulp interstitial zones filled with blood. Where identified the sinus reticulo-endothelial cells were swollen. A medium number of large phagocytic cells and plasma cells were seen in the pulp.

Kidney.—In numerous glomerular tufts, many capillary loops were filled with fibrin thrombi. The convoluted tubules exhibited ragged epithelium, and lumina were often dilated and contained granular material. Similar material in small amounts was seen in some glomerular capsules.

Suprarenal gland.—A few petechial hemorrhages were seen in the outer cortex. A mild periglandular plasma cell infiltration was noted. Occasionally in the subcapsular capillaries minute thrombi were observed. The medulla contained a few clusters of infiltrating lymphocytes.

Urinary bladder.—The epithelium was intact. There was sparse subepithelial mononuclear cell infiltration.

Stomach.—The glandular zone of the mucosa in an area less than 1 cm. in width exhibited recent necrosis and hemorrhage. This lesion did not extend deeper than the muscularis mucosae.

Rectus muscle.—Areas of hemorrhage were prominent. In areas muscle fibers were swollen, showed increased oxyphilia, and had lost all striations and nuclei. In these necrotic areas, proliferating fusiform cells were seen.

Mammary gland.—There was a slight cystic dilitation of the ducts, but no other changes were noted.

Femoral nerve.—With the exception of a few monocytes seen around some of the small blood vessels, no changes were observed.

Thyroid gland.—No lesions were seen.

Lymph node, periaortic.—Follicles were inactive, and sinuses were moderately widened but without unusual cell content.

Vertebral bone marrow.—The marrow was cellular. No abnormalities were observed.

Brain.—Cerebellar and cerebral cortex, corpus striatum, thalamus, pons, medulla, and cervical cord were studied. No inflammatory infiltrate or necrosis was seen.

Bacteriology.—As in case 17, at the time of the autopsy, using blood agar plates and thioglycollate broth heart blood, lungs, liver, spleen, meninges, and brain were cultured, and again were negative for pathogenic bacteria. No bacteria were seen in any of the smears of organs or in tissue sections.

With 2-mm. oil immersion objective much searching of lung slides finally revealed an extracellular cluster of minute basophil coccobacillary bodies. In a few swollen alveolar lining cells or large free cells minute faintly stained coccobacillary bodies were observed. No bodies were observed in the liver or spleen.

SUMMARY OF CASE 18

As seen in case 17, there was deep purplish-plum consolidation in varying proportions of the four major lobes. Sharp lines separated the involved from noninvolved lung. Again a predominantly large mononuclear cell, sero-sanguino-fibrinous alveolar exudate was found, and alveolar lining cells were hyperplastic. Interalveolar septa were slightly to moderately widened and with slight infiltration by mononuclear cells. Thrombosed septal capillaries were numerous. Thrombi frequently plugged small arteries, and a few small infarcts were seen. As in case 17, bronchioles and bronchi showed little change.

Associated changes were: serous pleural exudate, large hemorrhages and hyalin necrosis of rectus muscles, acute subcapsular hemorrhages and focal necroses of

liver, large mononuclear cells and swollen Kupffer cells in liver sinusoids, mild myocarditis, acute splenitis, a few capillary thromboses, and petechial hemorrhages of suprarenal cortex, thromboses in glomerular capillaries of kidney, and mild cystitis.

Nonrelated abnormalities were: calculus of pancreatic duct and multiple small uterine leiomyomata.

A few minute intra- and extracellular coccobacillary bodies were observed in pulmonary alveolar exudate.

DISCUSSION

PSITTACOSIS

Through the courtesy of Dr. R. D. Lillie[4] opportunity was given to study sections from several autopsies on cases of psittacosis. It is considered worth while to compare and contrast our 2 cases with psittacosis as seen in this material and as described by Dr. Lillie in his monograph (*3*), which deals with 9 cases studied by him and 43 cases collected from published autopsy reports.

In general, there appear to be many striking similarities in the pathologic changes in the two conditions, but in psittacosis there is definite tendency for the consolidation to be lobular in character even though a whole lobe is involved. Generally, the consolidation was referred to as gray or gray red and granular. In 3 of the 52 cases (cases 1, 25, and 41) a blue-red color is mentioned which may have been somewhat similar to the color we designated "purplish plum." There was no reference to the sharply outlined zones of demarcation between involved and uninvolved parenchyma which was so impressive in both of our cases. In microscopic sections of the lungs of psittacosis cases the findings of many groups of air or serum-filled alveoli in otherwise consolidated sections was typical This patchy distribution and the abrupt change in character of the alveolar exudate from field to field were not commonly seen in our sections There was, though, definite similarity in (1) the composition of the alveolar exudate, (2) the hyperplasia of the alveolar lining cells, (3) the predominance of large mononuclear cells and relative absence of polymorphonuclear leucocytes in the alveolar exudate, (4) only slight widening and infiltration of interalveolar septa, and (5) little change in large bronchioles and bronchi.

Irregularly dispersed foci of coagulation necrosis were seen in the liver in several cases of psittacosis. Our second case had subcapsular foci of coagulation necrosis, but no necrosis was seen in the deeper areas. The swelling and phagocytic reaction of Kupffer cells appeared similar in the two diseases.

The splenic changes in psittacosis and in our cases were roughly comparable. In 1 case of psittacosis (case 50) occasional hyaline glomerular capillary occlusions were seen in the kidney. Many

[4] Chief, Pathology Laboratory, National Institute of Health

thrombosed glomerular capillaries were observed in our second case. Waxy degeneration of rectus muscles was reported in 11 and hemorrhage into these muscles was seen in 10 cases of psittacosis. Hemorrhage was pronounced in the rectus muscles of our second case, and hyalin necrosis was present in both cases.

Thrombi of pulmonary arteries were described in three cases of psittacosis. There were a few thrombi in small pulmonary arteries in our first and in medium-sized pulmonary arteries in our second case. Subarachnoid hemorrhage as seen in our first case was not recorded in psittacosis, but in a few cases of that disease there were perivascular petechial hemorrhages and focal necrosis in the brain which were probably similar to those observed in our first case.

Q FEVER

Also through the kindness of Dr. Lillie, slides from one case of Q fever (*4*) were studied and our cases compared with it directly as well as by use of the published pathologic report. In this case of Q fever the pneumonia was limited to one lobe and firm, gray consolidation was described. Microscopically there was some similarity in that the larger bronchioles and bronchi were relatively clear and polymorphonuclear leucocytes played little part in the alveolar exudate. In the lung of the Q fever case the alveolar exudate was more compact and had a much larger component of lymphocytes than in our cases. Also, in that condition the septa were more widened and considerably more infiltrated by lymphocytes and large mononuclear cells.

The liver in the case of Q fever did not show the Kupffer cell reaction seen in our cases, nor were the increased number of neutrophils found in the centrolobular sinusoids observed in our material. Splenic changes in the two conditions were roughly parallel.

ATYPICAL OR VIRUS PNEUMONIA

The so-called virus pneumonia is rarely fatal, and only a few autopsy reports have been made.

Longcope (*5*) describes two deaths occurring in cases diagnosed "atypical" pneumonia. One was in a 38-year-old man who died on the seventh day of illness. Autopsy revealed "extensive bronchopneumonia and mitral stenosis and insufficiency." Small areas of consolidation were seen in lobes which at first seemed consolidated but later were found "rather filled with fluid than consolidated." A generalized severe acute bronchitis was described. The bronchial exudate was composed of "about half polymorphs and half round cells." Very few neutrophils were seen in alveolar exudate.

The other death was that of a 40-year-old man on the fourteenth day of illness. Rheumatic heart disease with aortic insufficiency

and pulmonary infarctions were contributing factors in his death. The areas of consolidation were small and peribronchial in distribution. A purulent bronchitis was present.

Kneeland and Smetana (*6*) reported the autopsy findings in a woman, age 47, who died from atypical pneumonia after a prolonged illness of 6 weeks' duration. A lobular consolidation was seen in several lobes. The older areas of consolidation showed greatly thickened alveolar septa. The copious exudation of large mononuclear cells occurring in an area of more recent consolidation and illustrated by photomicrograph resembles that seen extensively in our cases. In contrast with our cases, there were purulent tracheobronchitis, foci of fibrinopurulent pneumonia, and a necrotizing pulmonary arteritis resembling periarteritis nodosa. Focal necroses were described in the liver.

Dingle (*7*) and coauthors in their comprehensive review on the subject of atypical pneumonia referred to a death at Camp Claiborne. The autopsy report described a hemorrhagic interstitial bronchopneumonia and acute bronchitis. The only similarity to our cases seems to have been in the relative paucity of neutrophils in the alveolar exudate.

SUMMARY

Detailed autopsy reports are made in two cases who died of pneumonitis. Each case exhibited similar lung changes, the most important of which were sharply defined purplish plum-colored consolidation, large mononuclear cell alveolar exudate, hyperplasia of alveolar lining cells, and slight or no involvement of bronchioles and bronchi. No bacterial etiology was established. A few clusters of intracytoplasmic, basophil, minute coccobacillary inclusions were seen in pulmonary alveoli in both and in a Kupffer cell in one case. These bodies appeared identical with "elementary bodies" seen in animals inoculated with organs from each case.

Pathologically these two cases in some respects resembled psittacosis but showed less in common with the one autopsy of Q fever which was reviewed and still less with the few reported autopsies of virus pneumonia.

ACKNOWLEDGMENTS

Dr. E. L. Landry, New Iberia, La., the patients' physician; Dr. W. L. Treuting, director of preventive medicine, Louisiana State Health Department; and Dr. B. J. Olson, Division of Infectious Diseases, National Institute of Health, attended and assisted with each autopsy.

Appreciation is expressed to Dr. R. D. Lillie, Chief, Pathology Laboratory, National Institute of Health, and to members of his staff for examining slides from these cases and giving opinions. Fur-

thermore, the writers are grateful to Dr. Lillie for the opportunity for studying some of his human material on psittacosis and Q fever.

Medical Technician Rubye A. J. Wilson, laboratory, United States Marine Hospital, New Orleans, La., prepared the histologic sections and did the many special stains used in studying these cases. Her cooperation is appreciated.

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AN EPIDEMIC OF A SEVERE PNEUMONITIS IN THE BAYOU REGION OF LOUISIANA

IV. A PRELIMINARY NOTE ON ETIOLOGY [1]

By B. J. Olson, *Surgeon*, and C. L. Larson, *Passed Assistant Surgeon, United States Public Health Service*

Bacteriological studies were made of four cases of pneumonitis (cases 16, 17, 18, and 19). Throat washings were examined during their illness, and autopsy material was obtained from cases 17 and 18. The virus was isolated from all cases studied except case 19. Isolations were made from the throat washings of case 16 on the ninth day of illness and on cases 17 and 18 on the third day of illness. The same virus was recovered from cases 17 and 18 at autopsy. It was readily isolated in white mice by either the intraperitoneal or intranasal route of inoculation, and in guinea pigs by intraperitoneal injection of throat washings or tissue suspension. The symptoms and gross pathology in animals were similar to those produced by the psittacine group of viruses with the production of readily demonstrable elementary bodies in the smear of the spleen, liver, and lungs.

[1] From the Division of Infectious Diseases, National Institute of Health.

Owing to the fact that guinea pigs are highly susceptible and respond with a fatal infection, and that mice succumb when inoculated either intranasally, intraperitoneally, intracerebrally, intramuscularly, or subcutaneously with infectious material, it is suggested that we were dealing with a new etiological agent. A detailed report on the characteristics of the agent will be published at a later date.

MOUSE PROTECTIVE ANTIBODIES IN HUMAN SERUMS FOLLOWING INJECTIONS WITH CHOLERA VACCINE[1]

By JAMES J. GRIFFITTS, *Passed Assistant Surgeon, United States Public Health Service*

Cholera has been confined, in recent years, to areas where it is considered endemic. However, the misfortunes of war have sent members of the armed forces into these areas in great numbers, and the danger of the spread of cholera to the military and civil populations must be considered. Among important safeguards is the vaccination against the disease of military personnel of the United States assigned to duty in regions where cholera is endemic.

This study was made to obtain data on the appearance and persistence of serum antibodies in man after injection with cholera vaccine

PROCEDURE

Samples of blood were drawn from 34 white, male medical students 21 to 26 years of age, most of whom were 22 or 23 years old. None of the group gave a history of cholera vaccination, nor had any ever been in endemic or recently epidemic areas.

Following the withdrawal of blood samples each student was given an injection subcutaneously of 0.5 cc. and, after 1 week, 1.0 cc. of a vaccine prepared at the National Institute of Health.

Blood samples were taken from the entire group 2 weeks, 3 months, 6 months, 12 months, and 18 months after these injections were completed. In addition, samples were taken from 16 members of the group 1 week and again 1 month after the last injection.

Following the bleeding at 6 months, 16 students received an additional 1.0 cc. of vaccine. Seven weeks later these students were bled, as were an equal number of volunteers who had not received additional vaccine.

Thirteen months after the initial course of vaccine all but 7 of the group were given an additional 1.0 cc. injection of the vaccine.

The vaccine.—The procedure recommended by the Biologics Control Laboratory of the National Institute of Health was followed in the preparation of cholera vaccine. Inaba (NIH 35A3) and Ogawa

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[1] From Biologics Control Laboratory, National Institute of Health.

(NIH 41) strains of *V. cholerae* were grown separately on meat infusion agar for 24 hours at 37° C. The growth was washed off with salt solution (containing 0.5 percent phenol) and suspensions equal to 8,000 million organisms per cc. were made by matching with turbidity standards. Equal amounts of Inaba and Ogawa vibrio suspensions were pooled. Sterility tests and safety tests were made and the vaccine was assayed in mice for potency. This vaccine was equivalent to the vaccines supplied to the armed forces of the United States.

REACTIONS

Local.—Twenty-five of 34 men had tenderness about the site of the first injection, 4 of whom stated that the local pain was moderately severe and accompanied by aching in the arm injected. The remaining 9 had no soreness. After the second injection, local reactions were about the same, 22 having moderate tenderness. The site of injection was usually surrounded by an area of redness and slight edema 3 to 6 cm. in diameter. Ten individuals had local reactions extending 10 to 12 cm. after the first dose.

Systemic.—Ten men complained of headache, usually appearing 2 to 5 hours after the first injection of vaccine and lasting a few hours. After the second dose, 5 had moderately severe headache, 3 of whom had similar symptoms after the first injection. Three students reported slight fever (temperatures were not recorded) with accompanying chilliness after the first dose. Three others complained of slight muscular aching. In one instance slight axillary gland enlargement with tenderness was reported.

The reactions are summarized in table 1. In general, the extent of reactions was more moderate after the second dose of vaccine. Reactions were not severe as no student was absent from class because of reaction and no systemic symptom persisted longer than 24 hours, nor local discomfort longer than 48 hours. Following additional doses at 6 and 13 months, respectively, local reactions were slight and no systemic reaction was reported.

TABLE 1.—*Summary of reactions in 34 individuals given cholera vaccine*

Symptom or sign	Frequency of occurrence	
	After first injection	After second injection
Tenderness at site of injection	25	22
Redness and edema		
3 to 6 cm. diameter	24	30
Over 6 cm. diameter	10	4
Headache	10	5
Fever	3	0
Muscular aching	3	0
Axillary gland enlargement	1	0

METHODS

Samples of blood were drawn and serums separated under aseptic conditions. Immediately after separation serums were stored at 0° C. and tests begun within 3 days of bleeding were completed in 1 week.

Mouse protection tests.—These procedures were patterned after the methods described by Siler and others, of the United States Army Medical School, for serum protection tests against *E. typhosa* (*1*). Equal numbers of male and female white Swiss mice of the regular National Institute of Health strain, weighing 10 to 13 grams, were used. Twenty-five hundredths cc. of the individual serum diluted 1:2.5 with sterile physiologic salt solution was injected intraperitoneally into each of 30 mice. Each mouse thus received 0.1 cc. of serum. One hour after serum was given, 6 groups of 5 mice each received varying doses of living vibrios in mucin by intraperitoneal injection. Three groups of mice received the Inaba strain (NIH 35A3) in doses of approximately 50,000,000, 5,000,000, and 500,000 vibrios, respectively. The other three groups received three comparable doses of the Ogawa strain (NIH 41). The test strains were those used in preparing vaccine and on each day of testing a fresh culture, preserved by drying *in vacuo* from the frozen state in sterile milk, was used.

Test doses of vibrios were prepared from 5- to 6-hour-old meat infusion agar cultures, the basic dilution being a saline suspension of vibrios having a turbidity equal to that of 500 parts per million of silica standard (*2*). One part of this dilution in 9 parts of 5 percent mucin suspension represented the 10^{-1} test dose (50,000,000 vibrios). Serial tenfold dilutions were prepared in normal saline, test doses being tenfold dilutions in mucin from saline suspensions one dilution lower. Pour plate colony counts of the 10^{-7} saline dilutions on each day of testing gave on the average approximately 100 organisms per cc.

One-half cc. amounts of mucin-suspended organisms were injected intraperitoneally, the dilutions 10^{-1}, 10^{-2}, 10^{-3} being given mice which had received serum while control animals were given the dilutions 10^{-5}, 10^{-6}, 10^{-7}, and 10^{-8}. On the first few tests, serums of unvaccinated individuals were used in virulence titrations of the vibrios, and since no appreciable difference was found between these and subsequent titrations in mice without previous serum injection, the majority of virulence tests were made without serum injections. Separate tests were performed with the Inaba and Ogawa strains of *V. cholerae*. Animals were observed for 72 hours.

The mucin vehicle was prepared by suspending 100 gm. of granular mucin in 2,000 cc. of distilled water. This suspension, after straining

through 6 to 8 thicknesses of gauze and adjusting to pH 7.4 with 0.1 N. sodium hydroxide, using bromthymol blue as an indicator, was autoclaved in small flasks at 15 pounds pressure for 30 minutes.

Fifty percent end points (*3*) were calculated on the basis of the number of lethal doses against which mice were protected by serums. A sample protocol (table 2) shows results of tests at various dates, including virulence titration and the number of lethal doses against which 50 percent of mice were protected by the injection of serum No. 10.

TABLE 2.—*Protocol showing results of mouse protection tests with serum No. 10 at various intervals before and after vaccination. Test strain: Inaba (35A3)* Vibrio cholerae

Date of bleeding	Amount of serum per mouse	Dilution test organism	Number of vibrios	Number of mice	Deaths: 24 hours	Deaths: 48 hours	Deaths: 72 hours	Deaths: Total	Number of lethal doses resisted [1]
Aug. 21, 1942 (before vaccination).	0.1 cc	10^{-1}	62,000,000	5	5	-		5	Less than 3,000
		10^{-2}	6,200,000	5	5		-	5	
		10^{-3}	620,000	5	4	1	-	5	
	Controls (0.1 cc normal serum)	10^{-5}	6,200	5	4	1	-	5	Dilution = One 50 percent LD = 1/3,160,000
		10^{-6}	620	5	3	0	0	3	
		10^{-7}	62	5	1	1	0	2	
		10^{-8}	6	5	0	0	0	0	
Sept. 11, 1942 (2 weeks after last dose).	0.1 cc	10^{-1}	72,000,000	5	0	0	0	0	Greater than 144,000.
		10^{-2}	7,200,000	5	0	0	0	0	
		10^{-3}	72,000	5	0	0	0	0	
	Controls (no serum)	10^{-5}	7,200	5	3	1	0	4	Dilution = One 50 percent LD = 1/1,440,000
		10^{-6}	720	5	3	0	0	3	
		10^{-7}	72	5	1	0	0	1	
		10^{-8}	7	5	0	0	0	0	
Nov. 20, 1942 (3 months after last dose).	0.1 cc	10^{-1}	43,000,000	5	2	0	0	2	200,000
		10^{-2}	4,300,000	5	1	0	0	1	
		10^{-3}	430,000	5	0	1	0	1	
	Controls (no serum)	10^{-5}	4,300	5	2	2	0	4	Dilution = One 50 percent LD = 1/3,160,000.
		10^{-6}	430	5	3	0	0	3	
		10^{-7}	43	5	2	0	0	2	
		10^{-8}	4	5	0	1	0	1	

[1] 50 percent end points.

The 10^{-1} dilution was the largest dose of the series which could be used to show protection even when hyperimmune rabbit serum was given to the mice. Ten times this dose was too toxic for mice. Because of this limiting factor, it was supposed that greater differences in the mouse protective ability of serums might be shown by challenging mice given various amounts of serum with a constant test dose of organisms. Since the optimal test dose was not known, 3 doses of organisms were used with each serum dilution. Thus, in addition to the lethal dose titrations described above, data were obtained by titering the serums of 16 individuals taken before the injections and one week, 2 weeks, 1 month, 3 months, and 6 months after the injections. Four pools of 4 serums each were made, and each pool was diluted so that 3 groups of 15 mice each received 0.1 cc., 0.01 cc., and

0.001 cc. of serum, respectively. The groups of mice were further divided into units of 5 mice each and the test doses 10^{-1}, 10^{-2}, and 10^{-3} were injected. The dilution of serum which protected 50 percent of mice was calculated by the 50 percent end point method. A sample protocol is shown in table 3.

TABLE 3.—*Protocol showing results of mouse protection tests with serum pool No. 1. Three dilutions of the serum pool of each bleeding are tested with three test doses of* Vibrio cholerae, *Inaba strain 35A3*

Date of bleeding	Test dilution of vibrios	Approximate number of vibrios	Amount of serum per mouse (cc.)	Number of mice injected	Survivals	Deaths	Calculated 50 per cent end point of serum
Aug. 21, 1943 (before vaccination)	10^{-1}	59,000,000	0.1	5	0	5	Greater than 0.1 cc.
	10^{-2}	5,900,000		5	0	5	
	10^{-3}	590,000		5	0	5	
Sept. 4, 1943 (1 week after last dose)	10^{-1}	59,000,000	0.1	5	3	2	0.068 cc.
			0.01	5	0	5	
			0.001	5	0	5	
	10^{-2}	5,900,000	0.1	5	5	0	
			0.01	5	2	3	0.01 cc.
			0.001	5	1	4	
	10^{-3}	590,000	0.1	5	5	0	0.0014 cc.
			0.01	5	5	0	
			0.001	5	2	3	
	10^{-5}	5,900	No serum	5	0	5	
	10^{-6}	590		5	1	4	
	10^{-7}	59		5	3	2	
	10^{-8}	6		5	5	0	

Agglutination reactions.—Duplicate sets of serum dilutions were made to determine the agglutinin titers for the Inaba and Ogawa strains of *V. cholerae*. The serums were diluted in threefold steps from 1:20 through 1:4860.

Suspensions of living 6-hour agar-grown cholera vibrios, in normal saline, were used as antigens. The turbidity of the suspensions was equal to that of 300 parts per million of the silica standard. Equal parts of antigen and serum dilutions were mixed in a small test tube, agitated, and incubated at 37° C. for 2 hours. Reactions were read immediately and again after 22 hours at 5° C. Readings were made without lenses, and a positive reaction was one in which macroscopic clumps persisted after shaking the contents of the tube. No attempt was made to distinguish "O" and "H" agglutinins. High titered "O" rabbit serums were used as positive controls while saline suspensions of organisms served to rule out spontaneous agglutination of the antigens.

RESULTS

Mouse protection tests. Serums of 34 students before vaccination showed a uniform lack of mouse protective substances against the three test doses of vibrios used, and an absence of agglutinins for either strain of vibrio. The degree of immunity exhibited by serums before and after vaccination is summarized in table 4. Immunity

TABLE 4.—*Degree of protection afforded mice against* V. cholerae *by 0.1 cc. of individual serums before and after vaccination*

Time of bleeding	Vaccination history	Number of serums	Inaba strain 500,000 N	P	C	Inaba 5,000,000 N	P	C	Inaba 50,000,000 N	P	C	Ogawa strain 500,000 N	P	C	Ogawa 5,000,000 N	P	C	Ogawa 50,000,000 N	P	C
Before	No vaccine	34	33	1	0	33	1	0	34	0	0	33	1	0	33	1	0	34	0	0
2 weeks after	0.5 cc. and 1.0 cc. at 1 week interval	34	0	1	33	0	0	34	3	11	20	0	1	33	0	0	34	6	10	18
3 months after		34	0	2	32	0	1	33	14	16	4	0	0	34	0	4	30	3	22	9
6 months after		34	0	5	29	2	8	24	18	11	5	0	4	30	2	6	26	0	12	22
7¾ months after	Additional dose at 6 months	16	0	2	14	0	3	13	5	6	5	1	0	15	0	1	15	6	7	3
	No additional dose	16	1	1	14	1	4	11	6	7	3	0	1	15	0	3	13	8	5	3
	Total	32	1	3	28	1	7	24	11	13	8	1	1	30	0	4	28	14	12	6
12 months after	Additional dose at 6 months	16	1	2	13	0	3	13	4	12	0	1	4	11	0	3	13	1	9	6
	No additional dose	16	0	3	13	0	3	13	7	7	2	1	0	15	0	5	11	7	6	3
	Total	32	1	5	26	0	6	26	11	19	2	2	4	26	0	8	24	8	15	9
18 months after	No additional vaccine	3	0	0	3	0	0	3	0	2	1	0	0	3	0	1	2	1	1	1
	Additional dose at 6 months only	4	0	0	4	0	0	4	0	2	2	0	0	4	0	1	3	0	4	0
	Additional dose at 13 months only	14	0	0	14	0	3	11	4	8	2	0	2	12	0	9	5	5	7	2
	Additional doses at 6 and 13 months	12	0	0	12	0	0	12	0	8	4	0	1	11	0	2	10	4	3	5
	Total	33	0	0	33	0	3	30	4	20	9	0	3	30	0	13	20	10	15	8

N = No protection (4 or 5 of 5 mice died).
P = Partial protection (2 or 3 of 5 mice died).
C = Complete protection (4 or 5 of 5 mice survived).

was designated as complete when none, or 1, of the 5 mice tested died; partial in those wherein 2 or 3 died; and immune substances were judged absent when 4 or 5 of the test animals died.

Two weeks after the second dose of vaccine the majority of serums protected mice against even the largest challenge dose.

At 3 months and at 6 months after vaccination all serums protected mice against the smaller test doses while there was a definite decrease in the number of serums protecting mice against the largest test dose.

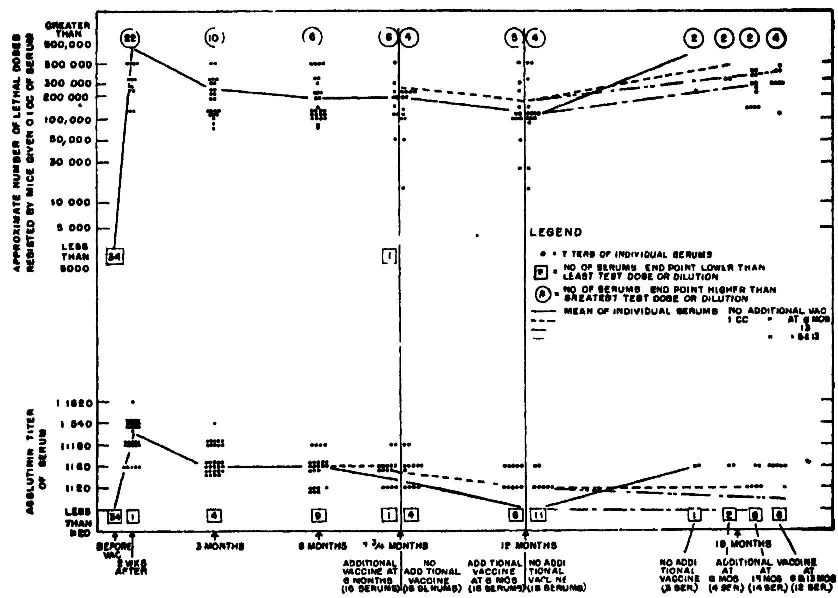

FIGURE 1 Mouse protective titers and agglutinins of serums of individuals injected with cholera vaccine

Of those receiving an additional dose of vaccine at 6 months, a slightly greater number showed partial or complete protection 7 weeks and 6 months later than those getting no additional vaccine.

A greater proportion of the serums of those receiving two additional doses of vaccine completely or partially protected mice than serums of those given but one additional dose at 13 months after the initial course of vaccine. However, three individuals who received no additional vaccine maintained a high level of mouse protective antibodies for 18 months.

The number of lethal doses against which mice were protected by the injection of 0.1 cc. of the individual serums was distributed as shown in figure 1. Agglutinin titers for each serum are represented in the lower part of the figure.

Before vaccination, end points were not reached as serums did not protect mice against the 10^{-3} test dose, while after vaccination end points frequently were not reached as many serums gave complete

protection against the largest test dose. As shown in figure 1 the mean of serums prior to vaccination showed no protection against 5,000 lethal doses of the Inaba strain. Two weeks after vaccination the mean rose above the 500,000 lethal dose level; at 3 months it had fallen to approximately 300,000 lethal doses, and at 6 months to approximately 200,000 lethal doses.

Serums of those given an additional dose of vaccine at 6 months showed a very slight increase in protective ability 7 weeks later and 6 months later. The revaccinating doses appeared to cause a slightly higher level of immunity for the entire group as reflected in the mean titers yet, perhaps due to individual variations, three serums from those who received no additional dose of vaccine were at as high a level as the others.

Differences in the concentration of protective substances in serums as indicated by the number of lethal doses resisted by mice were further confirmed by serum dilution studies of the 4 pools of serum (table 5).

TABLE 5.—*Pooled serums Amount of serum protecting 50 percent of mice against 3 test doses of the Inaba strain of* Vibrio cholerae, *at various times before and after vaccination. Each pool consists of serums from the same 4 individuals at each bleeding*

Time of bleeding in relation to vaccination	Amount of serum (cc.) required to protect 50 percent of mice against test doses of vibrios											
	Test dose=5,000 LD [1]				Test dose=50,000 LD [1]				Test dose=500,000 LD [1]			
	Pool 1	Pool 2	Pool 3	Pool 4	Pool 1	Pool 2	Pool 3	Pool 4	Pool 1	Pool 2	Pool 3	Pool 4
Before	>0.1	>0.1	>0.1	>0.1	>0.1	0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1
1 week after	0.0014	0.006	0.004	0.001	0.01	0.006	0.024	0.0014	0.068	0.032	0.032	0.032
2 weeks after	<0.001	<0.001	<0.001	<0.001	0.006	0.006	0.002	0.032	>0.1	>0.1	>0.1	0.068
1 month after	0.001	0.001	0.001	0.002	0.005	0.005	0.003	0.032	>0.1	>0.1	0.032	0.068
3 months after	0.01	0.032	0.014	0.004	0.032	0.032	0.042	0.026	0.068	>0.1	>0.1	>0.1
6 months after	0.032	0.032	0.014	0.042	0.068	0.068	0.042	0.042	0.068	>0.1	>0.1	>0.1

[1] 50 percent lethal doses

Less serum was required to protect mice against each test dose of vibrios during the period from 1 week to 1 month after vaccination than at 3 or 6 months. At this latter date, however, protection was afforded mice against large numbers of vibrios by as little as 0.014 to 0.068 cc. of serum. Of the 16 individuals represented in the 4 pools above, some received additional vaccine, others did not, and these pools could not be compared at 12 and 18 months. However, separate pools were made of the serums of (*a*) 3 individuals who received the first two vaccine injections, (*b*) 4 students who received an additional dose at 6 months only, (*c*) 14 students who received an additional dose at 13 months only, and (*d*) 12 students who received additional doses

at 6 and 13 months, respectively. The amounts of serum of each of the above groups necessary to protect 50 percent of mice against approximately 50,000 lethal doses were (*a*) 0.05 cc., (*b*) 0.043 cc., (*c*) 0.036 cc., (*d*) 0.039 cc. The concentration of mouse protective antibodies thus appeared to be greater in those receiving the additional dose at 13 months although differences were very slight.

No material variations in results were noted in tests using the Inaba or Ogawa strains except that the Ogawa strain was consistently more virulent for mice, i. e., fewer organisms were required to kill control animals.

Agglutination reactions. Agglutinins absent before vaccination appeared in high titer 1 week after vaccination in the serums of 15 individuals (table 6). In the entire group titers were highest at 2 weeks, the mean of the serums being 1:360 dilution when tested with the Inaba strain. At 3 and 6 months after vaccination the mean was a dilution of 1:60. At 12 months, in spite of the additional dose of vaccine being given to half of the group, the titers dropped, the mean being 1:20 in those receiving an additional dose of vaccine at 6 months and less than 1:20 among others. After 18 months the level for the whole group was quite low (fig. 1).

TABLE 6. *Serum agglutinin titers in individuals vaccinated with cholera vaccine*

Time of bleeding	Number of serums	Number of serums distributed according to titer — Against Inaba strain: Less than 1:20	1:20	1:60	1:180	1:540	1:1620	Against Ogawa strain: Less than 1:20	1:20	1:60	1:180	1:540	1:1620
Before vaccination	34	34	0	0	0	0	0	34	0	0	0	0	0
1 week after	15	1	0	1	6	6	1	1	0	0	2	6	6
2 weeks after	34	1	0	5	11	16	1	0	0	2	6	12	14
1 month after	15	0	0	0	8	7	0	0	0	1	8	5	1
3 months after	34	4	0	19	10	1	0	8	1	11	13	1	0
6 months after	34	9	8	13	4	0	0	8	7	14	5	0	0
7¾ months after													
Additional 1 cc. vaccine at 6 months	16	1	4	9	2	0	0	0	1	9	6	0	0
No additional vaccine	16	4	4	6	2	0	0	6	1	6	3	0	0
Total	32	5	8	15	4	0	0	6	2	15	9	0	0
12 months after													
Additional vaccine at 6 months	16	6	5	5	0	0	0	6	5	5	0	0	0
No additional vaccine	18	11	5	2	0	0	0	11	4	3	0	0	0
Total	34	17	10	7	0	0	0	17	9	8	0	0	0
18 months after													
No additional vaccine	3	1	0	2	0	0	0	1	0	2	0	0	0
Additional vaccine at 6 months	4	2	0	2	0	0	0	1	1	2	0	0	0
Additional vaccine at 13 months	14	8	4	2	0	0	0	8	2	4	0	0	0
Additional vaccine at 6 and 13 months	12	6	1	5	0	0	0	6	3	3	0	0	0
Total	33	17	5	11	0	0	0	16	6	11	0	0	0

Considering the group as a whole, agglutinin titers generally paralleled the mouse protective titer for at least 6 months. At 12 months the agglutinins dropped more sharply than mouse protective titers. Individual serums frequently showed a lack of correlation between height of agglutinins and protective antibodies.

DISCUSSION

Previous immunological studies on the effect of cholera vaccine in man employing serum agglutination and bactericidal tests have been made (*4*, *5*, *6*) and results reported here are in agreement with those as far as early appearance and persistence of agglutinins are concerned. Agglutinin titers in the present study were higher than is usually reported, probably owing to the use of living vibrios as antigens in the tests.

It appears from this study that mice may be of definite value in demonstrating specific protective substances in serum against cholera organisms and that these substances may be present in the absence of agglutinins for the vibrio. The significance of the level of protective antibodies in relation to the ability of the individual to resist cholera infection following exposure is, of course, not known. Serum protective antibodies appear within 1 week and are quite concentrated for 1 month after vaccination, a finding that should warrant the use of vaccine in the face of threatening cholera epidemics. The apparent lack of appreciable increase in the mouse protective antibody level after revaccination at 6 months does not follow the pattern seen in diphtheria or tetanus revaccination studies, in which a definite sharp rise in antibodies has been demonstrated (*7*, *8*). This may be due to the limits of the test procedure, to the possibility that a sharp brief rise may have occurred and subsided in 7 weeks, or that no additional stimulus to antibody formation resulted from the revaccinating dose.

SUMMARY

A mouse protection test of human serums against *V. cholerae* is described.

Mouse protective substances appeared in the serum of human volunteers 1 week following vaccination. These antibodies were present at least 18 months after vaccination and were more concentrated in serums at 1 week and 1 month than at 3 or 6 months.

Agglutinins appear 1 week after vaccination, remain at high titer (1:180–1:1620) for 1 to 2 weeks and then decline, the majority of serums having low titers at 6 months, 1 year, and 18 months. In this study no definite correlation between height of agglutinin and mouse protective titers could be made.

ACKNOWLEDGMENTS

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THE REARING OF STERILE ADULT *ANOPHELES* [1]

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Trager (*1*) obtained sterile *Aedes aegypti*, larvae and adults, in a medium consisting of autoclaved liver extract and brewers' yeast. Similar results have not been reported for *Anopheles* in this or other sterile medium. Barber (*2*) reared *Anopheles* in various media containing but a single species of living microorganism. Mature *Anopheles* were obtained in pure cultures of an infusorian, a yeast, an alga, and a bacterium.

The aim of the present work was to determine if in any of these pure cultures the microorganism dies out leaving sterile adult *Anopheles*; further, if such proved to be the case, whether such sterile adults could be obtained in a sufficiently robust condition and in quantities adequate for use in experiments.

The medium used in most of the present work was basically that of the yeast and liver extracts of Trager. This medium was modified somewhat to suit the microorganisms grown with the larvae, since many trials showed that the medium alone did not regularly bring the anopheline larvae even to the fourth instar. The basic medium could be made very simply: To tap or distilled water was added by weight 0.7 percent of Lilly liver extract and 1.0 percent of Harris brewers' yeast powder. The tap water of Memphis, Tenn., obtained from deep

[1] From the Office of Malaria Investigations, National Institute of Health.

wells, served as well as did distilled water. This mixture was brought to boiling over the free flame, with vigorous stirring to avoid scorching. Enough sodium hydroxide was added to bring the pH to approximately 6.5. An exact adjustment of the pH did not seem to be essential for the microorganisms employed. These grew well in a medium varying from pH 6.0 to pH 7.0. The addition of certain ingredients seemed to favor the growth of ciliates, for example, 2 gm. per liter of Difco blood serum. This powder was added gradually while the basic medium was boiling hot and was well stirred in, with the result that particles of coagulated blood serum remained suspended in the liquid. Addition of 1 percent of dextrose improved the growth of some of the organisms. To a flask containing 350 cc. of medium was usually added at least 20 cc. of fine, clean sand or earth in order to insure the presence of various inorganic constituents. After autoclaving, the addition of about 1 percent of sterile blood or blood serum, although not essential, seemed to improve the medium.

To the autoclaved medium sterilized eggs of anophelines were added, together with a pure culture of the microorganism which was to serve as larval food. Among various bacteria and infusorians employed, certain of the ciliates proved to be most successful. They were less liable than bacteria to produce pellicles or otherwise to modify the medium so as to render it less fit for larvae. Two species (or possibly strains) of *Glaucoma* gave very good results. I also used *Tetrahymena geleii*.[2] All of these ciliates were "pure line" cultures isolated by means of the pipette.

The addition of a pure culture of a nonmotile alga, a species of *Ankistrodesmus*, did not materially improve the medium.

The mosquito eggs were sterilized on a cloth held in a perforated spoon as described by Barber (*2*). The eggs were washed from the filter paper on which they were laid into the cloth on the spoon. They were then treated for a few seconds with 70 percent alcohol or other reagent to remove the air, then for about 15 minutes with White's solution (mercuric chloride, 0.25 gm.; sodium chloride, 6.5 gm.; hydrochloric acid, 1.25 cc.; ethyl alcohol, 250 cc.; distilled water, 750 cc. (*1*)) This solution was dripped over and between the eggs for about 15 minutes. The White's solution was then washed away by dripping with sterile distilled or tap water for about 5 minutes, and the cloth and eggs removed from the spoon and dried for about 15 minutes between layers of wire gauze with asbestos centers, previously sterilized in the Bunsen flame. Dried eggs float and a larger proportion of them hatch than when sunken.

By means of a moistened platinum spatula the eggs were taken up and distributed in test tubes containing beef broth or other medium suitable for determining the presence of bacteria. Usually they were

[2] The author is indebted to Prof G W. Kidder, of Brown University, for identification of this ciliate

kept for 2 days in the broth until hatched, and only the test tubes containing sterile larvae were subsequently transferred to flasks. Sometimes the dried eggs were transferred directly to the breeding flasks and their sterility determined by later tests.

The eggs were usually sterilized in batches of several hundred and 50 or more transferred to each test tube. The proportion hatching in different batches varied from 30 percent to 1 percent or less, a part of the eggs being killed in sterilization.

As a rule, eggs laid the night before sterilization were employed, usually from a race maintained in an insectary. In a few batches eggs from wild mosquitoes were used. All were *Anopheles quadrimaculatus;* however, some limited experiments with other species indicated that these could be reared as well.

Mosquito cultures were usually done in Erlenmeyer flasks of from 500 cc. to 3 liters capacity. Test tubes proved unfavorable, as might be expected from the feeding habits of *Anopheles*, where wide surfaces are advantageous. Cultures were kept at room temperature or in the insectary at a temperature of about 25° C.

The adults reared in these cultures were usually large and strong when proper conditions were maintained. Their longevity could be increased by feeding on sterile defibrinated blood plus a little honey. Feeding of adults on defibrinated blood thus treated may be employed in the insectary as a substitute for feeding on the living animal, and fertile eggs are also obtained by this means. It is theoretically possible to rear a batch of *Anopheles* in a flask, to feed them there, and to obtain fertilization and oviposition: thus to maintain a flask colony.

The following tests of contamination or sterility were employed: Of the fluid in which the mosquitoes had reached the pupal or adult stage large samples were cultured both aerobically and anaerobically for contaminants. Adult mosquitoes were likewise cultured to determine the presence of bacteria. Tests were made in media favorable for the growth of the infusorian. Many such tests were done in various media and under various conditions of growth. Tests of sterility were continued in order to detect the presence of any slow-growing contaminants. Smears were made of both abdominal and thoracic contents of adult mosquitoes. It seemed definitely proved that adult mosquitoes were obtained free from any kind of microorganism, the ciliate being too sensitive to drying or otherwise rendered unable to carry over into the adult mosquito. If any resistant forms of the ciliate ever developed, they did not appear in medium used.

Not all cultures developed an abundance of strong mosquitoes capable of flight. There was comparatively little difficulty in obtaining large, apparently healthy larvae of the fourth instar, but not uncommonly a portion would die after reaching this or the pupal stage, or would emerge on the surface of the liquid but be unable to

fly afterwards. Many experiments were done to insure larger batches of adults. Various media were employed, including the sterile bodies of adult *Anopheles* heated and unheated. It appeared that the quantity as well as the quality of food, especially that of larger larvae, was a very important factor in development of anophelines

It was doubtful if waste products of metabolism played an important part in inhibiting growth. Cultures in which a batch of adults had been successfully reared were reinoculated and again gave good results.

But in spite of some failures, many batches of strong, flying, sterile adults were obtained, sometimes 10 or more per flask, a sufficient number for experimental purposes.

CULTURES OF LARVAE WITH HEAT-KILLED CILIATES

At least two of the species of ciliate employed were killed when exposed to a temperature of 40° C. for 5 minutes. Many attempts were made to grow larvae to maturity in heat-killed cultures. Growth was better than in any other wholly sterile medium, often proceeding rapidly to the fourth instar; but good pupae or adults were never obtained. It is possible that not enough of the food was accessible to the larvae, although they were sometimes bred in very shallow layers containing many of the heat-killed ciliates. These, like the other experiments mentioned, suggest that after the beginning of the fourth instar the food requirements of anopheline larvae are relatively great.

DISCUSSION

It appears that this work offers a means by which the study of *Anopheles* in the larval stage is simplified; for it is necessary to deal with only one food organism, which is fairly adaptable to temperature or reaction of the medium. For adults the method here described offers the advantages which might be obtained by cultivating *Anopheles* in a sterile medium, especially as regards use of the dead or living mosquitoes for experiments on parasites, including *Plasmodia*. I have succeeded in rearing sterile adult *Anopheles*, causing them to bite a sterilized skin, and subsequently have transferred them living and sterile to test tubes, a beginning at least of a new approach to the problem of cultivation of *Plasmodia*.

SUMMARY

A method is here described of obtaining adult *Anopheles*, living, sterile, and in workable quantities, by cultivating them in a liver extract-yeast medium in the presence of a single species of ciliate.

REFERENCES

(1) Trager, William: The culture of mosquito larvae free from living micro-organisms. Am. J. Hyg., 22: 18 (1935).
(2) Barber, M. A.: The food of anopheline larvae—Food organisms in pure culture. Pub. Health Rep., 42: 1494 (1927).

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

The city and foreign reports which would have appeared in this issue will be published in the issue of October 27, while the State reports regularly scheduled for this issue will be published in the issue of November 3. This change is necessitated by a new arrangement with the Government Printing Office, whereby the Public Health Reports will, after a brief transition period, appear approximately on its issue date, instead of two weeks later, as at present.

PLAGUE INFECTION IN KERN AND SAN LUIS OBISPO COUNTIES, CALIF.

Plague infection has been reported proved in a pool of 164 fleas from 35 ground squirrels, *C. beecheyi*, taken September 9 from localities east of Castaic Lake, 2 to 4 miles east of Lebec, Kern County, Calif., and in a pool of 200 fleas from 24 ground squirrels, same species, taken August 25 from a ranch 2 miles east of San Luis Obispo, San Luis Obispo County, Calif.

COURT DECISION ON PUBLIC HEALTH

Injunction against enforcement of milk ordinance refused (Colorado Supreme Court; *Farmers' Dairy League, Inc.*, v. *City and County of Denver, et al.*, 149 P. 2d 370; decided May 22, 1944.) An ordinance of the city and county of Denver made it unlawful to sell or offer for sale within 1 mile of the exterior limits of the city and county any milk or other dairy products not produced, handled, processed, and distributed in conformity with the ordinances of the city and county and the regulations of the health department thereof when the person selling or offering for sale knew or had reason to believe that such milk or other dairy products were being purchased for use or consumption within the said city and county. A violation of the ordinance was punishable by fine or imprisonment or both. The plaintiff corporation was engaged in the dairy business and, although all of its business was carried on outside of the territorial limits of the city and county of Denver, a substantial part was conducted within 1 mile of such limits. It sought to enjoin the city and county and certain of its officers from enforcing the ordinance in question, alleging that such ordinance was unconstitutional, incapable of enforcement, and wholly void. The plaintiff further alleged that, unless restrained, the defendants, proceeding pursuant to the ordinance, would institute actions against the plaintiff to recover fines for alleged violations of the ordinance and would continue from time to time to institute proceedings, thereby creating and carrying on a multiplicity of suits against the plaintiff and compelling it to expend large sums to defend against such actions. This conduct, according to the plaintiff, would seriously impair and damage its business and irreparable injury would be done the plaintiff. The latter also averred that it had no plain, speedy, or adequate remedy at law. The defendants denied that the ordinance was unconstitutional, incapable of enforcement, or void but admitted that, unless restrained, they intended to enforce the ordinance against the plaintiff if it violated same. The defendants also answered that the complaint failed to state a claim upon which relief could be granted. The trial court gave judgment for the defendants and the plaintiff appealed to the Supreme Court of Colorado.

The latter court took the view that the plaintiff's action was not permissible, pointing out that complainants who challenged the validity of penal ordinances could urge every objection they had in defense of proceedings instituted against them. "In short, such complainants have an adequate and complete remedy at law." The

appellate court quoted from 32 C. J., p. 280, section 443, as follows: "Courts will not interfere by injunction where the injury inflicted or threatened is merely the vexation of arrest and punishment of complainant who is left free to litigate the questions of unconstitutionality of the statute or ordinance or its construction or application in making his defense at the trial or prosecution for its violation." The court did not think it fitting "that one impliedly purposing to violate a penal ordinance, as here, should enjoy predetermination at the hands of a court, which, whatever its conclusion as to the legality of the ordinance, is powerless to adjudge its enforcement."

The judgment of the lower court was affirmed.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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PATHOLOGIC REACTION TO THE VIRUS OF LYMPHOCYTIC CHORIOMENINGITIS IN GUINEA PIGS [1]

By R. D. Lillie, *Senior Surgeon*, and Charles Armstrong, *Medical Director, United States Public Health Service*

In the course of our studies of this virus (*1, 2, 3, 4, 5*), a series of guinea pigs was inoculated and their organs submitted for study at varying intervals after inoculation. As certain unexpected and interesting findings were revealed it seemed worthwhile to make a brief report.

The material comprised tissues from 18 guinea pigs killed 4 to 30 days after inoculation. Most of this material was obtained in 1936 and 1937.

The gross post-mortem findings were generally inconsiderable. A slight splenic enlargement was noted in four of the animals. Congestion or areas of consolidation of the lungs were found in five, not differing materially from the common pneumonia of guinea pigs. Peritoneal congestion, following intraperitoneal inoculation, necrosis at the site of subcutaneous inoculation, and slight enlargement of lymph nodes adjacent to the subcutaneous inoculation were noted in one guinea pig each. Material for histologic examination was fixed in Orth's fluid, imbedded in paraffin, sectioned, and stained by our Romanovsky method (*6*) and by Weigert's iron chloride hematoxylin with van Gieson's picrofuchsin.

The brains of 2 animals killed 4 days and 1 killed 30 days after inoculation showed no lesions. Twelve killed 6 to 27 days after infection showed scattered nodules or patches of lymphocyte infiltration in the pia mater of the base or major fissures or in the chorioid plexus of one or more ventricles, or in both. Generally the pia mater over the convexity was normal, and usually the chorioid plexus in at least one of the ventricles was uninvolved. Altogether chorioid plexus was found in sections in 37 ventricles and foci or patches of

[1] From the Pathology Laboratory and the Division of Infectious Diseases, National Institute of Health

lymphocyte infiltration of the plexus in 15. In a few guinea pigs lymphocyte infiltration of the sheath of one or more intracerebral vessels was found, and in 1 there was a fairly definite "node" of mesoglia cells in the medulla.

Altogether the reaction is strikingly less marked than in monkeys or mice (*1*, *2*). Perhaps it is more evident between the eighth and twenty-first days after inoculation.

In mice, Rivers and Scott (*3*) noted only slight gross cerebral congestion. Microscopically, there were meningeal congestion, occasional hemorrhages, and lymphocyte infiltration. Slight subependymal and chorioid plexal lymphocyte infiltration was noted. Intracerebral perivascular lymphocyte infiltration was rare in the acute stages, but perhaps considerable in amount in chronic cases and in animals killed 2 or 3 weeks after recovery.

In guinea pigs inoculated intracerebrally they noted a mild meningeal reaction characterized by infiltration by mononuclear cells The brain and cord showed little or no reaction. After subcutaneous inoculation the meningeal reaction was minimal.

In naturally infected mice Traub (*4*) found a slight, predominantly lymphocytic meningitis in 1 of 12 mice. After intracerebral inoculation a more or less pronounced meningeal infiltration was constantly present. The infiltrating cells were chiefly lymphocytes, next in numerical importance were mononuclear cells, and a small percentage were polymorphonuclear leucocytes. The meningitis was usually most marked at the base of the brain, and often extended also to the cord. Thirteen of 17 mice showed round cell infiltration of the chorioid plexus, more marked in the third and fourth than in the lateral ventricles. Some round cell exudation into the ventricles was noted; ependymal infiltration and subependymal gliosis were frequent. Extension of the round cell infiltration into the sheaths of submeningeal and subependymal vessels was noted in 10 of 15 mice. Areas of round cell infiltration of the brain stem, small clumps of oligodendroglia in the basal cortex, pyknotic and shrunken Purkinje cells, and occasional degenerated anterior horn cells surrounded by oligodendroglia and microglia were noted.

Intraperitoneal inoculation of mice gave a slight meningitis in one mouse, without plexal involvement. Moderate meningoplexal infiltration resulted in some mice inoculated intravenously.

Guinea pigs inoculated by various routes by Traub (*4*) inconstantly showed a meningeal and slight plexal infiltration by lymphocytes and mononuclears of much less intensity than in mice. Slight perivascular lymphocyte and mononuclear cell infiltration was rarely seen within the brain. Traub described single and multiple eosinophilic intranuclear inclusions in some of his guinea pigs. These occurred in pia cells, mononuclears in pia, vascular adventitia cells and subpial glia

cells. These inclusions were absent in the lungs of guinea pigs and in mice. Traub is doubtful of their significance. Findlay and co-workers (*7*) discount them and state that Thompson (*8*) has recently shown them to be due to a virus found in salivary glands of mice. Findlay et al. saw them in plexal epithelium in a few mice.

Rats inoculated intracerebrally by Traub (*4*) showed marked plexal round cell infiltration in the lateral ventricles and a meningitis intermediate in intensity between those seen in mice and guinea pigs.

Findlay, Alcock, and Stern (*7*) noted in intracerebrally inoculated guinea pigs an intense basilar leptomeningitis in which the exudate was predominantly lymphocytic with some admixture of plasma cells and polymorphonuclears. Similar exudate distended the villi of the choroid plexus and filled the ventricles. A little subependymal gliosis was the only intracerebral reaction. We have found a chronic proliferative ependymitis to be a quite common condition in guinea pigs in a variety of experimental and nonexperimental conditions. Mice showed a similar intense reaction, monkeys a less striking one, in contrast to our findings (*1*, *2*).

The heart has constantly shown lesions of greater or less extent and intensity. The lesions consist of focal infiltration by lymphocytes, of focal proliferation of fibroblasts, interstitially, beneath the endocardium and about small vessels, and of combined foci of lymphocyte infiltration and fibroblast proliferation. Concentric endothelial proliferation in small vessels accompanies the other manifestations in some cases.

These lesions occur constantly in the myocardium of atria and ventricles, are almost constant and more extensive, more marked, and more frequent beneath the mural endocardium, and usually are found in the epicardium, particularly in the atrioventricular sulcus. Valve lesions were found in 13 of the 18 guinea pigs, involving the mitral leaflets in 8 of 12 animals, the tricuspid in 4 of 11, the aortic cusps in 6 of 12, and the pulmonic in 2 of 3 animals. The method of longitudinal sectioning used did not regularly show all of the valves.

In one case (11 days) the only alteration of the valves was a focal interstitial exudation of metachromatic mucoid material with consequent thickening in both mitral leaflets, the base of a tricuspid leaflet, an aortic cusp, and the septal endocardium below the aortic insertion. A similar myxomatoid swelling of the aortic cusps was present in another guinea pig with proliferative alterations in the mitral valve (17 days) and in one guinea pig (8 days) myxomatoid swelling of the mitral leaflets was associated with focal proliferation of small fusiform fibroblasts just beneath the atrial surfaces. This patchy proliferation of small fusiform cells within the valve substance was the usual valve lesion, occurring usually beneath the atrial surfaces of the mitral and tricuspid valves and beneath the ventricular or, less often, arterial

surfaces of the semilunar cusps. In six valves or pairs of valves it was the only alteration. In one there was an admixture of lymphocytes. In two fibroblasts proliferation was mixed with lymphocyte and monocyte infiltration with an occasional leucocyte and a little karyorrhexis. In five valves there was associated with and overlying the focus of fibroblast proliferation a stratifying proliferation of the endocardial endothelium, reaching perhaps four layers of fusiform cells. One guinea pig (17 days) showed a small concentric nodule of loosely disposed fusiform fibroblasts in a myxomatous stroma in the base of a mitral leaflet.

The more conspicuous mural subendocardial foci more often showed mixture of lymphocytes with the proliferating fusiform fibroblasts, but stratifying endocardial proliferation was absent. Concentric endothelial and adventitial proliferation of small subendocardial vessels was associated in a number of instances. In one case (6 days) mixed focal subendocardial infiltration by lymphocytes and pseudoeosinophil leucocytes was present, in one (7 days) some monocytes were mixed with the fibroblasts and lymphocytes, and in a third (9 days) besides the fibroblasts and lymphocytes there were plasma cells, monocytes, pseudoeosinophil leucocytes, and a little pyknotic nuclear debris in some foci. In one guinea pig (17 days) with rather marked focal subendocardial lymphocyte infiltration and less fibroblast reaction, there was a small fibrinoid thrombus adherent to the endocardial surface over one of the focal lesions.

Myocardial foci occurred both in atria and ventricles. They were apparently more frequent and larger in the papillary muscles than elsewhere. In one case (25 days) a diffuse focus of lymphocyte infiltration and fibroblast proliferation in the ventricular septum near the base lay partially in the bundle of His. In another (6 days) there were a few small foci in the muscle or adjacent to arterioles, composed of interlacing, or less often fasciculated, large fusiform fibroblasts, some of which showed some lymphocyte infiltration. In about half of the animals some of the ordinary lymphocytic and fibroblast lymphocytic foci were perivascular in location, in some of them obvious adventitial proliferation of the small vessels occurred, and in four there was a concentric stenosing endothelial proliferation in small vessels.

Epicardial reactions were mainly in the form of interstitial and perivascular lymphocyte infiltration, fibroblast participation was less frequent, vascular adventitial and endothelial proliferation were infrequent. Interstitial serous exudation was occasionally seen. Plasma cell, monocyte, and polymorphonuclear admixture were recorded in one case (9 days). In one guinea pig (7 days) there was a nodule in the atrioventricular sulcus composed of large fusiform fibroblasts and infiltrated by lymphocytes and fewer monocytes and pseudoeosinophil

leucocytes. In one animal (17 days) there was some mesothelial swelling and desquamation.

The greater frequency of focal lesions in the heart is quite striking when compared with the lesions in rhesus monkeys (*2*).

Traub (*4*) noted in the majority of his guinea pigs subendothelial infiltrations with round cells, and very small, scattered round cell collections in the myocardium and epicardium. The muscle, as in our animals, was not affected.

The lungs constantly showed perivascular infiltration by lymphocytes of greater or less grade. This finding is so common in guinea pigs that its significance is doubtful when present in slight or moderate grade. However, in about half of the animals it was quite marked. In five guinea pigs it was so marked that secondary follicles or germinal centers were formed in some or most of the perivascular nodules.

As is common in guinea pigs, patches of atelectasis or of carnifying pneumonia, ranging from early fibroblast organization of a serofibrinous exudate through interstitial infiltration by fibroblasts, monocytes, or foamy epithelioid cells to a slight residual interstitial lymphocyte infiltration were found in 13 animals.

Mucoepithelial, mucopurulent, and serous exudates were often seen in the lumina of the bronchi, and hyperplasia of the mucosal lymphoid follicles was present in a few animals.

Possibly the more marked perivascular lymphocyte infiltration with formation of germinal centers is significant, as it was found in some animals without evidence of antecedent pneumonic changes and without purulent bronchitis.

In two animals the pleura showed flattened plaques of mesothelial proliferation. In one of them there was a subjacent irregular lymphocyte infiltration. In the other there was mesothelial desquamation and exudation of polymorphonuclears, monocytes, and phagocytic macrophages (pericardial pleura).

The nodular perivascular lymphocyte infiltration is common to guinea pigs and monkeys (*3*), while the congestion and edema seen in the latter are generally lacking in the former.

In the lungs of mice, Rivers and Scott (*3*) noted frequent areas of discoloration and consolidation which were (culturally?) free from bacteria. Microscopically these were an interstitial bronchopneumonia characterized by perivascular round cell infiltration and, in definitely consolidated areas, dense interstitial and peribronchial infiltration by mononuclear cells, desquamation of bronchial epithelium, irregular atelectasis or alveolar exudation of fibrin and few cells, usually mononuclears. Some sections showed only capillary congestion and a few alveolar hemorrhages.

In guinea pigs also they noted an interstitial bronchopneumonia, of which they published no further description. Their illustration

apparently indicates some interstitial cellular infiltration and extensive intra-alveolar organization.

In Traub's (*4*) intravenously infected mice the lungs, while grossly normal, showed more or less extensive round cell collections about vessels and bronchi, and an interstitial pneumonia in every case. This interstitial pneumonia was inconstant after intraperitoneal inoculation. After intracerebral inoculation slight septal thickening and an inconstant, slight peribronchial round cell infiltration were noted. Natural infection showed in two mice slight peribronchial and perivascular infiltration by round cells and slight septal thickening.

In guinea pigs Traub (*4*) noted frequent more or less extensive consolidation in advanced stages. Cultures were sterile in many cases, while in others various bacteria were cultivated. Histologically he simply notes a "typical virus pneumonia." Marked pulmonary edema was present in many guinea pigs.

Traub (*5*) noted interstitial pneumonia in five of seven mice killed 3 to 7½ months after infection while still carrying virus. He further noted the absence of peribronchial, perivascular, and interstitial round cell infiltration in the lungs of seven normal stock mice killed for histologic controls.

Findlay, Alcock, and Stern (*7*) noted the occasional presence of a virus pneumonia in mice, without giving further particulars, but made no mention of lung changes in guinea pigs or monkeys.

In the larynx, trachea, and extrapulmonary bronchi slight diffuse or denser focal lymphocyte infiltration was often present in the mucosa, and lymphoid follicles were sometimes encountered. Less often the mucosa was recorded as normal. Mucosal lymphocyte infiltration was usually associated with subacute pneumonic processes or purulent bronchitis or both, hence it is probably not significant. However, a similar reaction occurred in some monkeys (*2*).

In 1 animal with a nodular carnifying pneumonia there was an esophagitis characterized by focal lymphocyte infiltration of the corium, leucocyte emigration through and desquamation of the epithelium, and purulent exudate in the lumen. In 13 guinea pigs the esophagus was histologically normal. Similar negative findings were usually recorded in monkeys (*2*).

The submaxillary gland was normal in nine animals. In three there were patches or occasional foci of lymphocyte infiltration and in two an occasional solitary lymphoid follicle with germinal center was included within the gland. Possibly these lymphocytic foci are more frequent than in monkeys (*2*). Traub (*4*) found no lesions.

Thymic tissue was found adjacent to the submaxillary gland in nine animals. Partial involution was present in two, and in a third the cortex was hyperplastic, the cortical reticulum cells contained phagocytosed nuclear fragments, and there was polymorphonuclear

invasion of the parakeratotic Hassall bodies. In six there were no lesions. Monkeys showed no lesions (*2*).

In 10 guinea pigs the stomach was normal, in 2 it showed slight to moderate congestion, in 1 there were scattered clumps of lymphocytes in mucosa and muscularis, and in 3 focal destructive lesions were present in the mucosa. In one of the last the lesions were focal mucosal engorgement and hemorrhage with denudation of epithelium and free and attached masses of bacteria and necrotic epithelial cells on the surface. In another there were multiple hemorrhagic coagulative infarcts of the mucosa with necrosing thrombosed arteries and veins in and beneath the infarcts, edema of the surviving gastric wall, and focal vascular endothelial and adventitial proliferation with perivascular lymphocyte infiltration in the serosa. The last animal presented a small, partially epithelialized, granulating ulcer in the gastric mucosa. The destructive lesions have no parallel in monkeys, but much less diffuse infiltration is present in guinea pigs.

The small intestine was generally normal. Clumps of pigmented macrophages were present in the villi in two animals. In one there was an enteritis with pus in many crypts and infiltration of the villi by intact and fragmenting monocytes and polymorphonuclears; this was the animal with focal gastric hemorrhages.

In two other guinea pigs the colon showed respectively a patchy subepithelial edema and mucosal macrophage infiltration, and an acute colitis with mucosal edema, polymorphonuclear infiltration, pus in crypts, and lymphoid follicle hyperplasia.

Colonic, cecal, and sometimes ileal, lymphoid follicles often showed hyperplasia with accumulation of nuclear debris in the lymph clefts and swollen phagocytic reticulum cells of their germinal centers.

One guinea pig presented a small (1 mm.) shallow, suppurating ulcer in the cecum. In several, mucus secretion in the crypts was quite active. Focal perivascular lymphocyte infiltration and fibroblast infiltration were seen in the cecal submucosa of one animal. Otherwise the intestines were normal.

Summarizing, six guinea pigs presented acute ulcerative, exudative, or destructive processes in the gastrointestinal mucosae, whose relationship to the disease under consideration is questionable The follicle hyperplasia and phagocytic activity are in agreement with similar processes seen in other lymphadenoid tissues in infections with this virus. The focal proliferative vascular lesions with lymphocyte exudation seen in two guinea pigs are similar to those seen in other organs and tissues and appear significant.

Similar lymph follicle reactions, and nonspecific processes were seen in monkeys (*3*).

The omentum and mesentery were normal in 12 guinea pigs. In

1 there was an omentopancreatic abscess with marginal organization, associated with granulomata and staphylococcus abscesses in the spleen and granulomata in liver and renal pelvis. Foci of perivascular and submesothelial lymphocyte infiltration were present in the remaining 5 animals. In 2 of these there was some associated focal fibroblast proliferation just beneath the surface, and in 1 many patches of stratifying mesothelial proliferation with subjacent capillary endothelial and fibroblast proliferation and lymphocyte infiltration.

After intraperitoneal inoculation of mice Traub (*4*) found a serous pleuroperitonitis in about 20 percent, characterized by mesothelial swelling and slight subjacent round cell infiltration.

The liver showed no lesions in three animals killed 25, 27, and 30 days after inoculation. In three killed 4, 4, and 6 days after inoculation slight congestion was present in one, slight fatty infiltration in one, and both in the third. Eight guinea pigs, killed 6 to 14 days after inoculations, showed slight to moderate periportal lymphocyte infiltration, and two of these (9 and 14 days) and three more (16 to 18 days) showed moderate to rather marked filling of the liver cells by coarse fat vacuoles, more toward the centers of the lobules.

In addition five of these guinea pigs (6, 8, 8, 11, and 11 days) showed scattered small clumps of proliferating Kupffer cells and lymphocytes, grading in two into nodules of epithelioid cells and lymphocytes, which in one (11 days) included a few shrunken coagulated necrotic liver cells and showed marked hemosiderin pigmentation of the epithelioid cells.

In two animals (9 and 21 days) single foci of recent coagulation necrosis without marginal proliferation were found, in two (14 and 18 days) multiple focal coagulative necroses with patent capillaries and surviving or proliferating endothelial cells were present, and in one (7 days) there was a large area of centrally anemic, marginally hemorrhagic, coagulative necrosis with multiple satellite foci of centrolobular, hemorrhagic, coagulative necrosis, and dense lymphocyte infiltration and slight fibroblast proliferation in the abutting surviving hepatic tissue. One guinea pig showed multiple granulomata including a few necrotic liver cells and some leucocytes. This animal also had multiple granulomata and abscesses in the spleen with contained staphylococci, an omentopancreatic abscess, and granulomata in the renal pelvic fat.

Thus focal necroses or proliferative lesions were present in 10 of 11 guinea pigs killed from the sixth to the twenty-first days. The lesions in the last-mentioned animal were probably due to secondary infection.

Monkeys showed a similar incidence of focal necroses but comparatively little tendency to proliferative focal reactions (*2*).

Rivers and Scott (*3*) noted in mice some engorgement of capillaries, a definite Kupffer cell increase, and a few small areas of focal necrosis.

Traub (*4*) frequently noted in mice small collections of round cells about blood vessels, scattered single and clumped lymphocytes in the

parenchyma, and patchy Kupffer cell hyperplasia in naturally infected mice. In intracerebrally inoculated mice similar but less marked changes were noted, while after intraperitoneal inoculation perivascular lymphocyte and mononuclear cell inoculation was more marked, and after intravenous inoculation necrosis of some liver cells adjacent to round cell infiltration was noted.

In guinea pigs Traub (*4*) saw frequent fatty vacuolation of liver cells, often small perivascular clumps of round cells, and necrosis of groups of adjacent liver lobules in about 20 percent of the animals. Traub questions the significance of this necrosis.

Findlay, Alcock, and Stern (*7*) noted the presence of fatty degeneration, focal necrosis, and accompanying round cell infiltration in the livers of guinea pigs and monkeys (*M. irus* and *rhesus*), and of Kupffer cell swelling in mice.

Splenic enlargement was infrequent, congestion inconstant and usually of minor grade, and follicles were usually moderately hyperplastic. Moderate numbers of or numerous polymorphonuclear leucocytes were present in the pulp in all animals killed 4 to 11 days after inoculation, very few or none thereafter. After about 6 days a moderate to marked pulp reticuloendothelial swelling appeared and was present in all animals up to the latest studied (30 days). Free macrophages were present in the pulp in a few of these. Erythrophagia was common from the sixth to the eleventh day and was accompanied by moderate hemosiderosis which apparently became more marked from about the eleventh to the eighteenth day, diminishing thereafter. A moderate focal lymphocyte infiltration of the pulp was noted in 9 of 16 animals killed 6 or more days after inoculation. The reticulum cells of the splenic follicles were swollen and contained ingested nuclear debris in greater or less quantity, sometimes also leucocytes in 11 of the 16 guinea pigs killed after the fourth day.

In one guinea pig granulomata and granulomatous abscesses containing staphylococci were present. This animal also had granulomata in the renal pelvic fat and liver and a granulating omentopancreatic abscess.

In general, splenic reactions are of similar nature but more intense in grade than those seen in monkeys (*2*). The latter species did not show the polymorphonuclear reaction seen in the earlier stages in guinea pigs.

Rivers and Scott (*3*) stated that in mice the spleen showed nothing particularly characteristic and that the other organs (besides liver, lungs, and brain) showed no characteristic changes.

Traub (*4*) noted in mice after intraperitoneal inoculation a 50 to 100 percent enlargement of the spleen, after intravenous inoculation, up to six times. Miscroscopically there were follicle hyperplasia, pulp reticuloendotheliosis, and, with more marked enlargement,

pulp infiltration by lymphocytes and mononuclear cells. After intracerebral inoculation and in natural infections, mice showed no changes in the spleen.

In guinea pigs Traub (*4*) found no definite lesions in the spleen. Splenic corpuscle hypertrophy was present in 2 of 7 virus-carrying mice (*5*) dead respectively 7½ and 6 months after infection. The first also showed pulp megakaryocytosis, the second splenic enlargement and lymphocyte infiltration of the pulp.

The femoral marrow was one-third to one-fourth fatty in 2 guinea pigs (14, 30 days) and solidly cellular in the other 12 studied. Congestion and small nodules of reticulum cells were noted in 1 animal (8 days), a little erythrophagia in another (18 days), and foamy epithelioid cell granulomata with a few central polymorphonuclears in the animal with splenic abscesses, omental abscess, and renal and hepatic granulomata. Otherwise there were no focal lesions.

Pseudoeosinophil myelocytes were generally the predominant cell type; in three animals killed 17, 18, and 21 days after inoculation there were appreciable to considerable numbers of nongranular promyeloid cells. Polymorphonuclear leucocytes were generally numerous in animals killed 4 to 14 days after inoculation, few thereafter. Similarly, erythropoietic activity seemed greater in the first 2 weeks than later, while megakaryocytes were relatively reduced in numbers from the ninth to the eleventh day.

The guinea pigs showed an early leucocytic reaction not observed in monkeys (*2*).

According to Trab (*4*), three of seven intravenously inoculated mice showed marked leucocytosis, up to 55,000 per cu. mm. Monocytosis (4 to 23.5 percent) was present in six mice, lymphocytosis (62.5 to 80 percent) in five. Naturally infected mice, and those inoculated intracerebrally and intraperitoneally showed no blood changes.

Lymph nodes were studied in 14 guinea pigs, cervical in 8, mediastinal in 7, abdominal in 6, pelvic in 2 and unidentified in 1. A few nodes were recorded as normal, a few showed congestion or slight edema, and a few follicle hyperplasia of slight grade. More often there were a more marked swelling and hyperplasia of the follicles with more or less swelling and ingestion of pyknotic nuclear fragments by the intrafollicular phagocytic reticulum cells. Sometimes this was accompanied by swelling of reticulum cells in the pulp cords, and more often by slight to moderate swelling of the sinus reticuloendothelium. Erythrophagia and hemosiderosis were found in one group of abdominal nodes (21 days), slight macrophage exudation in another (25 days).

The reactions are quite similar to those seen in rhesus monkeys (*2*).

In guinea pigs Traub (*4*) found no lesions of lymph nodes. In mice inoculated intravenously he noted small lymph nodes with reticuloen-

dothelial hyperplasia in some. Naturally infected mice and those inoculated by other routes showed no lesions. One of Traub's (*5*) virus-carrying mice dead 6 months after infection presented a huge mediastinal lymphosarcoma.

The kidneys were studied in 17 guinea pigs. All showed usually minor grades of parenchymatous degeneration. The cortical convoluted and loop tubules were usually swollen, their epithelium finely granular and sometimes marginally frayed. Basal striation and rod borders were discernible in a few animals in some tubules. Foamy or granular albuminous exudate was present in the tubules in 5, hyaline casts in 2 guinea pigs.

In 12 guinea pigs foci of interstitial or perivascular lymphocyte infiltration were more or less numerous in the renal cortex, perhaps more often in the arcuate zone about the larger vessels. Concentric vascular endothelial proliferation of small cortical vessels was seen in one of these and in one other guinea pig. Usually few foci of glomerular endothelial proliferation were seen in 4 guinea pigs, associated with cortical interstitial lymphocyte infiltration in 2, and with periglomerular fibroblast proliferation in 1 of them. Periglomerular proliferation was seen also in another animal with cortical lymphocyte infiltration but no endothelial proliferative changes. Vascular and exudative changes were absent in 2 animals. Moderate infestations with *Klossiella cobayae* were present in 2 guinea pigs.

In two animals elongate calcified masses were present in the pyramids, between the tubules. The significance of these is not clear.

The renal pelvis showed focal diffuse and perivascular lymphocyte infiltration in eight guinea pigs, in the fatty tissue in four, in the mucosa in three, and in both in one. In one animal the pelvic fatty tissues contained small concentric, fibrosing nodules of epithelioid cells, some with multinucleate giant cells, some with peripheral lymphocyte infiltration. These were undoubtedly part of a subacute disseminated granulomatous process in which staphylococci were present in the splenic granulomatous abscesses.

In general the kidneys showed a greater tendency to exudative inflammatory reaction and less parenchymatous degeneration than in rhesus monkeys (*2*).

Traub (*4*) found no lesions in the kidneys of guinea pigs. Only after intravenous inoculation did he note in mice collections of round cells in the kidneys. In one mouse there was pronounced unilateral renal enlargement with cortical atrophy and huge round cell collections in cortex and pelvic tissues. Virus-carrying mice killed 3 to 7½ months after infection also showed an interstitial nephritis constantly (*5*).

Findlay, Alcock, and Stern (*7*) noted in monkeys a glomerular

swelling, more the result of endothelial swelling than of round cell infiltration, and occasional slight intertubular lymphocyte infiltration.

The urinary bladder was normal in nine guinea pigs, two showed focal lymphocyte infiltration of the mucosa, two more lymphocyte infiltration with focal proliferation of fibroblasts and vascular endothelia, in one of these also in muscularis and serosa, and in one the mucosa showed congestion, vascular endothelial swelling and small hemorrhages. Changes are slight compared with monkeys (*3*).

The seminal vesicles were normal in 11 guinea pigs. In 2 the muscularis and adventitia presented focal vascular endothelial swelling or proliferation, some adventitial proliferation, and, in 1, lymphocyte infiltration. In 1 guinea pig the subvesicular fascia showed a slight diffuse leucocyte infiltration of uncertain significance.

Ureters and penis were normal in the few specimens studied, except that in one case the ureter near the renal pelvis showed a focal lymphocyte infiltration of its mucosa, similar to that often seen in the renal pelvis.

Testis and epididymis were normal in 5 of the 17 male guinea pigs. In the other 12 the testis showed more or less intercellular edema and reticulation of the germinal epithelium, with desquamation of many epithelial cells, occasionally only Sertoli cells remaining. In 3 there was active mitotic regeneration, in 1 with epithelial giant cells in the lumina of the seminiferous tubules. In the 3 guinea pigs showing the slightest degenerative testicular changes the epididymis was normal. The rest showed usually empty tubules in the upper pole, rounded necrotic germinal epithelial cells in the upper part of the lower pole, grading to intact or necrotic spermatozoa in the large muscular tubules near the origin of the vas. In one of these there was a frankly purulent, subacute bilateral epididymitis with squamous metaplasia of tubules, interstitial infiltration by leucocytes and lymphocytes and concentric vascular endothelial proliferation. One other guinea pig showed some pus mixed with necrotic germinal epithelium and spermatozoa in the tubules, with sparse focal interstitial and perivascular lymphocyte infiltration in epididymis and cremaster. Two other animals showed a few foci of perivascular lymphocyte infiltration, 1 in the cremaster, 1, with vascular endothelial swelling and proliferation, in the epididymis.

In the single female guinea pig included in this series, the uteri and tubes were normal. The intraepithelial saccular glands of the vagina were not infrequently filled with pus. Inoculation was intravaginal.

The male genitalia showed acute degenerative reactions not seen in monkeys (*3*). However, the former were sexually mature, the monkeys juvenile. Exudative inflammatory changes assignable to virus reaction were comparatively infrequent in guinea pigs.

The pancreas was normal in 14 animals. The mucous glands of the ducts were hyperactive in 1 and the ducts distended with mucus. In 1 animal the pancreas bordered on an omental abscess, but portions distant from the abscess wall were normal.

Similar negative findings were recorded in monkeys (*2*) and in guinea pigs by Traub (*4*).

Lymphocyte infiltration varying from a few small clumps of lymphocytes to fairly dense foci was seen in four of the eight adrenals studied. One other showed two small capillary hemorrhages in the cortex. Similar changes occurred in monkeys (*2*), and, in addition, occasional focal necroses.

Traub (*4*) found no lesions in the adrenals of guinea pigs.

Findlay, Alcock, and Stern (*7*) noted focal round cell infiltration in the adrenals of monkeys, particularly in the cortex.

Sympathetic ganglia containing masses of chromaffin cells were encountered in three guinea pigs (16, 21, 25 days). One (16 days) showed focal lymphocyte infiltration, the other two were normal. A pararenal ganglion (7 days) showed marginal tigroid clumping. Other cervical, cardiac, abdominal, and pelvic ganglia showed no significant lesions.

The spinal ganglia of monkeys (*2*) usually showed sheath cell proliferation, lymphocyte infiltration, or both.

In 12 animals the thyroid was normal. In 1 there were moderate interstitial edema with scattered monocytes in the widened tissue spaces and thin watery colloid in the alveoli. In another there were foci of interstitial fibroblast proliferation and lymphocyte infiltration with concentric vascular endothelial proliferation.

No lesions were found in monkeys (*3*).

Normal parathyroids were found in three animals. Focal perivascular lymphocyte infiltration was seen in a few monkeys (*3*) and in one a focal necrosis.

Skeletal muscles were recorded as normal in 10 of 17 guinea pigs, and in 1 more one of two blocks studied was normal. One guinea pig (6 days) showed a single focus of vascular endothelial and adventitial proliferation with some lymphocyte infiltration, another (21 days) a single focus of perivascular lymphocyte infiltration. A few similar foci of both types were seen in another animal (11 days). A fourth (14 days) presented a mixed lymphocyte and monocyte or fibroblast reaction about occasional small vessels. In a fifth (27 days) there were marked focal interstitial and perivascular lymphocyte infiltration and vascular adventitial fibroblast proliferation, endothelial swelling, and hyaline thrombosis in a few vessels. In the remaining 2 (18, 30 days), occasional vessels showed respectively concentric endothelial swelling and perivascular lymphocyte infiltration, and in both scattered or single degenerating or necrotic muscle fibers, hyalinized and oxyphil, in the one with peripheral nuclear accumulation in basophilic

cytoplasmic masses, in the other with invasion of the necrotic fiber by fibroblasts, macrophages, and lymphocytes.

Only one monkey showed a sparse focal lymphocyte infiltration (*3*).

Sections from the site of subcutaneous inoculation were made in two guinea pigs. One such lesion 9 days after inoculation contained necrotic fragmenting leucocytes and fibrin, its margin was densely packed with fragmenting pseudoeosinophil leucocytes and granular debris, its wall was composed of concentrically disposed fusiform fibroblasts proceeding from between the abutting muscle fibers. In the later lesion, 14 days after inoculation, the wall was a fibroblastic granulation tissue with areas of organizing hemorrhage and hemosiderin pigmentation, numerous multinucleate giant cells, and oxyphil hyaline masses included in the free margin.

SUMMARY

Lymphocytic choriomeningitis infection in guinea pigs presents a relatively mild and chiefly basilar lymphocytic meningitis and focal lymphocyte infiltration of the chorioid plexus. There is also striking focal lymphocyte infiltration and fibroblast proliferation in the heart muscle, endocardium and epicardium. Focal lymphocyte infiltration with secondary follicles are seen in the lungs and respiratory passages. Focal necrotic, proliferative, and mixed lesions appear in the liver, together with evidence of fatty changes in some. An early polymorphonuclear infiltration and later reticuloendotheliosis and lymphoid cell infiltration are seen in the spleen pulp. Follicle hyperplasia and intrafollicular phagocytosis of nuclear fragments are noted in spleen, lymph nodes, and intestinal lymphoid follicles. In the kidneys there are mild parenchymatous degeneration and focal interstitial lymphocyte infiltration. Focal lymphocyte infiltration of the mucosa of the renal pelvis and bladder occur in less than half of the animals. Germinal epithelial degeneration is seen in the testis. Focal lymphocyte infiltration occurs in some animals in epididymis, adrenal medulla, skeletal muscle, thyroid, and submaxillary gland, in some with concomitant vascular endotheliosis. Muscle fiber degeneration and necrosis are found in occasional animals.

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MEDICAL CARE: A PRIVATE ENTERPRISE OR A SOCIAL SERVICE?[1]

By JOSEPH W. MOUNTIN, *Medical Director, United States Public Health Service*

One of the very hopeful signs of the time is the increasing tendency of producers and consumers to meet for frank discussion of ways and means of extending and improving medical service. The issues involved are manifold and not simple of solution. While physicians occupy a central position in the provision of this service, it should be borne in mind that other groups also have their parts dentists, nurses, and a variety of technicians. Persons representing these several skills cannot be fully effective without access to hospitals, clinics, and related facilities which serve as their workshops. Clearly it is the province of the medical and allied professions to determine the content of the medical care program. Likewise, it is their responsibility to foster the development of new and improved methods for preventing, detecting, and alleviating human ailments. In carrying out these purposes the professions concerned are entitled to every aid that can be placed at their disposal.

On the other hand, disease has its social implications. It is the people at large who suffer the discomforts of illness and the economic consequences thereof. If the illness is minor in character, the wage loss and the costs of care probably will not be a source of serious embarrassment to an individual in moderate circumstances. A more protracted illness or one entailing expensive forms of treatment may drain off the patient's resources to a point where assistance is necessary Any general impairment of health affects national vitality.

The increasing public interest and concern about questions involving medical care can be traced to two distinct but somewhat related factors: First, the measurable benefits that now may be derived from good medical service; and second, the increasing proportion of the population that is denied full participation in these benefits. The situation today presents a striking contrast to that which obtained when the prevailing pattern of medical practice took form.

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Even as late as the beginning of the present century, most people spent the greater part of their lives in the same area where they were born or first established residence; hence, a general feeling of neighborliness prevailed. The sick were cared for in their own homes by members of the family under the general direction of a local physician. For diagnosis the physician relied on his powers of observation; his remedies likewise were simple. Figuratively speaking, he practiced medicine out of a black bag which contained little more than a stethoscope, a clinical thermometer, a bistoury, and a limited assortment of pills and potions. Dentistry, nursing, and hospitalization were practically unknown to the great masses of the population. Under such circumstances, as one might expect, the costs of illness were not high. And because the physician knew personally his entire clientele, their social habits, and their economic position, it was possible for him to extend credit, vary fees, or remit payments, according to individual circumstances. In many respects this kind of relationship afforded a desirable type of health supervision, but it may be questioned if the primitive methods of diagnosis and treatment in use could have influenced favorably the course of a very high proportion of the illnesses so attended.

Industrialization of itself was sufficient to render obsolete this highly individualistic form of medical practice. A high degree of mobility in the population always accompanies industrialization. The factory worker has less economic security than the owner of a farm or a small business. Industrialization also places a high value on physical fitness. The net result has been the creation of problems of health, security, and happiness.

Concurrent with the socioeconomic evolution profound changes have taken place in the field of medicine, especially within the past half century. By drawing on the several basic sciences medicine has evolved highly complex, yet very effective, bodies of knowledge and skills for preventing, detecting, and alleviating human ailments.

The acquisition of this fundamental information and the varied skills essential for its application entail an arduous process of training. In less complex days young men entered medicine after being apprenticed to older physicians for a short time. Nowadays a person is not admitted to practice until he has completed 6 to 8 years of education following graduation from high school. This lengthy schooling represents a personal outlay approximating $10,000 on the part of each student or his sponsor. To that sum may appropriately be added the cash value of what he would have produced in goods or services if he had followed a gainful occupation instead of acquiring a college and medical education. Since tuition paid by students meets only a small part of the cost of operating medical schools and teaching hospitals, society at large is called upon to make its contribution to medical

education. Because of these factors a physician ready for professional work represents a large investment which is reflected in the value of his services.

Furthermore, in the practice of modern medicine, it is necessary that physicians have ready access to physical facilities represented by hospitals, clinics, and laboratories, and be assisted by the skilled staffs associated with such institutions. While adding to the effectiveness of diagnostic and therapeutic procedures, the full use of such resources materially increases the cost of medical care. Without such facilities, however, the patient cannot hope to obtain all the benefits which medical sciences have to offer.

In one very essential field—namely, organization—medicine has not kept pace with its own scientific advancement or with the social and economic changes in the body politic.

Despite successful demonstration of group practice and prepayment plans, it would appear that the prevailing opinion within the profession sustains the view that the most desirable arrangement is for each physician to operate as a unit and be paid directly by the patient on the basis of fees for service rendered. These principles, literally interpreted and applied, would preclude the introduction of schemes of organization that have operated so successfully in fields of commerce and industry; they would not permit the spreading of risk through the insurance technique; the consuming public would not have any voice in management; and there could be little or no participation on the part of government. Happily this extreme position does not prevail in actual practice.

Experience has demonstrated that such rigid principles cannot be applied to the whole range of medical service for reasons that are more or less obvious. Even in prosperous times a substantial proportion of the population is not self-supporting, and a much larger group is precipitated into the so-called medically indigent class by the occurrence of even moderately severe illness. Such conditions as mental disease, tuberculosis, and chronic invalidism often require prolonged periods of institutional care. This of itself is very expensive; moreover, these disorders almost invariably have a permanent depressing effect on income. In still another class are the communicable diseases which require special treatment facilities and the use of both law-enforcement and health-education measures. For want of a better term, this broad and variable category of disorders is sometimes referred to as "unprofitable illness," largely because the remedial measures indicated are not adapted to application by private enterprise. Even nonprofit agencies, many of which derive a substantial part of their incomes from endowments and gifts, have not been able to operate extensively in this field. Hence, the job falls to government and the costs are borne out of taxes.

Most of the current controversy centers around that group of human ailments often spoken of as "profitable illness." In the main, these are the short-term illnesses experienced by self-sustaining members of the population. The patient is expected to pay for the care he receives either out of pocket or on credit, coupled perhaps with some adjustment of fees. Up until quite recently, in this country, medical care for profitable illnesses had somewhat the social status of shoes, clothing, groceries, or recreation. That is, it represented a need which should be recognized by the individual and be satisfied according to his wishes within the limit of his purchasing capacity. With this arrangement there could be no disagreement, provided medical care had the same essential characteristics as the articles mentioned and occupied a similar position in respect to human necessity. But few persons would claim the complete identity of medical care with shoes, much less their similarity.

The head of the household can estimate in advance, with a high degree of accuracy, his expenditures for shoes, clothing, groceries, and recreation. In fact, these costs vary little from day to day or month to month, except as the price index fluctuates. By substitution and denial, a family head may adjust expenditures for these commodities without seriously affecting the health or happiness of his household. But the family head is not in a position to meet his illness problems so easily. One family group may live together for several years and experience no serious illness, another may pass from one medical disaster into another, while still a third may have the so-called average illness experience. For an ensuing period the illness patterns of these families may continue unchanged or they may be completely reversed. No one can predict what the illness experience of any family, or of any of its members, will be even during the course of a day. Since treatment must be adapted both to the character of the illness and to the reactions of the patient, advance estimates on costs likewise are not within the range of calculation; hence, budgeting for illness by the individual is not feasible.

Under a system where receipt of service is dependent on ability to pay for it, one naturally expects that service will be apportioned accordingly. Despite all assertions to the contrary, that is what actually occurs. Physicians are known to give generously of their time in ministering to the sick of limited means, but this gratuitous service falls far short of effecting complete equalization in receipt of care among persons of all income groups. A large part of the difficulty arises from the fact that persons in the lower economic brackets have more illness than do those in better financial circumstances. Furthermore, a combination of lowered vitality and a tendency to delay seeking care seems to result in unduly severe illness among the poor.

Thus more prolonged and expensive forms of treatment than otherwise would be indicated are necessary.

Accumulating funds for paying medical bills may be only part of the problem in obtaining care. If no physician is within reach it matters little whether or not the patient can pay the prevailing fee Regardless of financial considerations, a patient's need for hospitalization cannot be satisfied unless such facilities are available Perhaps one of the most serious obstacles in the way of adequate care for everyone is the inequable distribution of professional personnel and hospital accommodations In general, their distribution follows economic lines when State totals are considered.

TABLE 1—*Number of hospital beds and physicians in States of different income classification, 1940*

State per capita income	General and allied hospital beds per 100 000 population	Physicians per 100 000 population
Total United States	385 9	133 0
Under $300	214 1	76 7
$300–$599	331 6	110 0
$600 and over	457 0	160 3

Within the States both physicians and hospital beds tend to be concentrated in centers of population It is recognized, of course, that centers of population are apt to be centers of wealth also However, analyses made by the United States Public Health Service show that a hospital of itself exerts a definite influence both in attracting physicians to a community and in retaining their services

TABLE 2—*Number of hospital beds and physicians in metropolitan and nonmetropolitan counties*

Character of county	General and allied hospital beds per 100 000 population (1940)	Physicians per 100 000 population (1938)
Metropolitan	507 5	168 9
Nonmetropolitan	246 9	92 1

TABLE 3—*Number of hospital beds and physicians in counties of different urban character*

Largest urban place in county	General and allied hospital beds per 100 000 population (1940)	Physicians per 100,000 population (1938)
No urban place of 2,500 or over	96 8	66 8
City 2,500–49,999 in county	295 5	100 6
City 50,000 or over in county	538 0	179 2

Since economic factors are largely responsible for the present concentration of professional and hospital resources in centers of population and wealth, there is reason to suppose that payments for service out of a pooled fund derived from taxation or insurance, would do much to reverse current trends. To meet the special needs of low-income and sparsely settled areas, it will probably be necessary also to make direct grants for the construction and operation of hospitals and to supplement the income of professional personnel.

In general it may be said that the amount and character of medical service the people receive are determined by three factors: (1) their financial resources, (2) the availability of properly trained personnel, and (3) the presence of hospitals and related facilities. During different periods in our recurring economic cycles and in different parts of the country, one or the other of these hurdles may be the most prominent obstacle. At no time in the experience of this country have the forces of free enterprise, supplemented by charity, brought about a combination of circumstances under which good medical care is available to everyone. Whether or not it can be accomplished under any other system may be open to question. Nevertheless, a substantial part of the general public and some very thoughtful members of the medical and allied professions believe additional methods should be tried.

In the discussion so far, little mention has been made of disease prevention. Despite its over-all importance from the standpoint of general health, prevention has never become a prominent element of private medical practice. Activities that contribute to disease control and general health promotion, for the most part, are now supported by taxation and administered by agencies of Federal, State, and local governments. While public health agencies have to their credit many outstanding accomplishments, such as the conquest of yellow fever and typhoid fever, and the very substantial reduction in deaths attributable to tuberculosis, diphtheria, and the disorders of infancy, there are still further possibilities in the preventive field of endeavor. To exploit these possibilities traditional health programs need to be strengthened and the geographic coverage of health services, under the direction of full-time professional personnel, should be extended to all parts of this country. In addition, some method should be developed whereby the system established primarily to render medical care to the sick may also serve the interest of preventive medicine.

The blending of preventive and curative forces and their full utilization in a complete health program scarcely seems possible so long as the receipt of service is contingent upon payment by the beneficiary of a fee to cover the cost of the service. Such a system

obviously restricts service to those who are both willing and able to pay for it on such a basis. If a health program is to be comprehensive the primary objective must be to remove this financial barrier. Furthermore, every citizen must be encouraged to utilize the service up to the limits indicated by his need. Variation in need for service should have no weight in determining what payments shall be made by the individual.

In addition to satisfying the foregoing medical needs of the people, a national health program must make provision for research. Unless this is done, stagnation, and eventually retrogression, will set in. Research should be of sufficient breadth and intensity to insure reasonable advancement in every sector of the entire health field. Another and equally essential provision of a health program designed to insure continuous progress is that of professional education. While the present system for instructing medical students has attained a high degree of excellence, it makes no orderly provision for keeping up to date the physician in practice. This defect especially should be remedied in plans for the future.

An attempt has been made to present some of the social and economic aspects of disease, together with a few of the problems that are involved in its prevention and alleviation. Extensive studies serve to support the well-known fact that illness is highly unpredictable both as to character and time of occurrence. Also it is a matter of common knowledge that a person of limited income has great difficulty securing adequate care for even ordinary illness at a price within his means. In many sections of the country diagnosis and treatment of complicated illness are scarcely possible because the necessary professional personnel and physical facilities are not within reach. While mortality statistics suggest a high level of general health, the results of physical examinations show we are not a robust people. It would therefore seem that many of the splendid accomplishments of public health agencies are being nullified by failures in the application of curative medicine. Ways and means for correcting this defect should receive special consideration in any plan that is designed to improve the health of the individual citizen. Actually, as a people we have not attained a level of health that is possible under the present state of scientific knowledge. Hardly anyone can envision the still higher levels that may be reached should health become one of our chief social objectives when the energies of the people can again be diverted from war to the pursuits of peace.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period January–June 1944

The following is a list of publications of the United States Public Health Service issued during the period January–June 1944.

The purpose of the publication of this list is to provide a complete and continuing record of Public Health Service publications for reference use by librarians, scientific workers, and others interested in particular fields of public health work, and not to offer the publications for indiscriminate free public distribution.

Those publications marked with an asterisk (*) may be obtained only by purchase from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the prices noted.

Periodicals

*Public Health Reports (weekly), January–June, vol. 59, Nos. 1 to 26, pages 1 to 856. 5 cents a number.

*Venereal Disease Information (monthly), January–June, vol. 25, Nos. 1 to 6, pages 1 to 196. 5 cents a number.

*Journal of the National Cancer Institute (bimonthly), February June, 1944, vol. 4, Nos. 4 to 6, pages 339 to 600. 40 cents a number.

Public Health Engineering Abstracts (monthly), January–April, vol. XXIV, Nos. 1 to 4, 32 pages each; May–June, Nos. 5 and 6 combined, 32 pages.

National Negro Health News (quarterly), January–March, vol. 12, No. 1, 20 pages; April–June, No. 2, 24 pages.

Reprints From the Public Health Reports

2535. National inventory of needs for sanitation facilities. 1. Public water supply. By H. W. Streeter and Ray Raneri. January 7, 1944. 20 pages.

2536. Lesions in rats given sulfathiazole, sulfadiazine, sulfanilamide, sulfamerazine, sulfapyrazine, or acetylsulfadiazine in purified diets. By K. M. Endicott, A. Kornberg, and F. S. Daft. January 14, 1944. 6 pages.

2537. Illness from cancer in the United States. By Harold F. Dorn. January 14, 21, and 28. 46 pages.

2538. Cultivation of *Pasteurella tularensis* in a liquid medium. By Edward A. Steinhaus, R. R. Parker, and Max T. McKee. January 21, 1944. 2 pages.

2539. Sanitation manual for public ground water supplies. February 4, 1944. 41 pages.

2540. National inventory of needs for sanitation facilities. II. Milk pasteurization facilities. By John Andrews and A. W. Fuchs. February 11, 1944. 16 pages.

2541. I. A comparison of light trap and animal bait trap Anopheline mosquito collections in Puerto Rico. II. A list of the mosquitoes of Puerto Rico. By A. Earl Pritchard and Harry D. Pratt. February 18, 1944. 13 pages; 2 plates.

2542. An index of the prevalence of dental caries in school children. By John W. Knutson. February 25, 1944. 12 pages.

2543. Location and movement of physicians—methods for estimating physician resources. By Elliott H. Pennell. March 3, 1944 25 pages.

2544. The reportable diseases. Diseases and conditions required to be reported in the several States. By William Fowler. March 10, 1944. 24 pages.
2545. Problems created by returning malaria carriers. By Stanley B. Freeborn. March 17, 1944. 8 pages.
2546. Complement fixation in the rickettsial diseases—technique of the test. By Ida A. Bengtson. March 24, 1944. 4 pages.
2547. The action of penicillium extracts in experimental tuberculosis. By M. I. Smith and E. W. Emmart. March 31, 1944. 8 pages.
2548. Entomological phases of the recent dengue epidemic in Honolulu. By Robert L. Usinger. March 31, 1944. 8 pages.
2549. The effect of a synthetic marihuana-like compound on musical talent as measured by the Seashore test. By C. Knight Aldrich. March 31, 1944. 4 pages.
2550. Nomenclature of pneumococcic types. A study of cross reactions among the pneumococcic types and their application to the identification of types. Cross reactions between the several pneumococcic types and their significance in the preparation of polyvalent antiserum. By Bernice E. Eddy. April 7 and 14, 1944. 36 pages.
2551. Hospitals in the public health panorama. By Warren F. Draper. April 21, 1944. 10 pages.
2552. The patch test in contact dermatitis. By Louis Schwartz and Samuel M. Peck. April 28, 1944. 12 pages.
2553. Airplane dusting with paris green for control of *Anopheles quadrimaculatus* Say in water-chestnut covered areas of the Potomac River during 1943. By William C. Murray and Herbert Knutson. May 5, 1944. 12 pages; 2 plates.
2554. The therapeutic efficacy of penicillin in relapsing fever infections in mice and rats. By Harry Eagle and Harold J. Magnuson. May 5, 1944. 6 pages.
2555. Organization of the medical and sanitary program, Alaska highway project. By Edwin H. Carnes. May 12, 1944. 9 pages; 2 plates.
2556. Pathologic changes in sheep resulting from exposure to low barometric pressures. By John W. Miller. May 12, 1944. 4 pages; 2 plates.
2557. The chemotherapy of burns and shock. VI. Standardized hemorrhage in the mouse. VII. Therapy of experimental hemorrhage. By Herbert Tabor, Herman Kabat, and Sanford M. Rosenthal. May 19, 1944. 21 pages.
2558. Studies on trichinosis. XVI. Epidemiological considerations based on the examination for trichinae of 5,313 diaphragms from 189 hospitals in 37 States and the District of Columbia. By Willard H. Wright, Leon Jacobs, and Arthur C. Walton. May 26, 1944. 13 pages.
2559. A strain of typhus rickettsiae isolated from the brain of a wild rat in California. By M. Dorthy Beck, Howard L. Bodily, and Rosemary O'Donnell. June 2, 1944. 12 pages.
2560. Prevalence of poliomyelitis in the United States in 1943. By C. C. Dauer. June 2, 1944. 8 pages.
2561. Sulfarsphenamine in the therapy of syphilis. A comparative study of the toxic manifestations of neoarsphenamine and sulfarsphenamine. By Thomas F. Probey, Edgar W. Norris, Austin V. Deibert, and Eleanor V. Price. June 9, 1944. 20 pages.
2562. The therapeutic efficacy of phenyl arsenoxides in mouse and rabbit Trypanosomiasis (*Tryp. equiperdum*). By Harry Eagle, Ralph B. Hogan, George O. Doak, and Harry G. Steinman. June 16, 1944. 20 pages.

2563. Births, infant mortality, and maternal mortality in the United States—1942. By J. Yerushalmy. June 23, 1944. 14 pages.
2564. A sieve device for sampling air-borne microorganisms. By H. G. duBuy and L. R. Crisp. June 30, 1944. 4 pages; 1 plate.
2565. Production of vitamin K deficiency in rats by various sulfonamides. By A. Kornberg, F. S. Daft, and W. H. Sebrell. June 30, 1944. 12 pages.

Supplements to the Public Health Reports

18. Malaria. Lessons on its cause and prevention for use in schools. By H. R. Carter. Revised by L. L. Williams, Jr., June 28, 1943. 1944. 23 pages.
174. The notifiable diseases. Prevalence of certain important communicable diseases, by States, 1942. 1944. 13 pages.
175. The bedbug—its habits and life history and methods of control. By Willard H. Wright. 1944. 9 pages; 2 plates.
176. Nursing in the United States Public Health Service. By Katharine S. Read. 1944. 6 pages.

Public Health Bulletins

281. The aliphatic alcohols: Their toxicity and potential dangers in relation to their chemical constitution and their fate in metabolism. By W. F. von Oettingen. 253 pages. 1943.
282. Toxicity and potential dangers of penta-erythritol-tetranitrate (petn). By W. F. von Oettingen, D. D. Donahue, A. H. Lawton, A. R. Monaco, H. Yagoda, and P. J. Valaer. 1944. 39 pages.
283. Nursing practices in industry. By Olive M. Whitlock, Victoria M. Trasko, and F. Ruth Kahl. 1944. 70 pages.

Workers Health Series

12. Let's See! 1944. 10 pages.
13. Below the Belt. 1944. 6 pages.

Posters

Community Health Posters. Four colors, each 10 x 14 in.

3. Build out rats—screen ventilators, cover floor holes, install metal flashing, seal openings, lay concrete floors.
4. Don't feed rats.

Workers Health Posters. Two colors, each 10 x 14 in.

18. Cover up coughs and sneezes. A bad cold may be flu! See your doctor
19. Don't gamble with appendicitis—don't use a laxative—call a doctor
20. Welding. Guard against: explosives, electric shock, burns, gases, powerful arc lights.
21. Let's see! Better, longer, easier.
22. Be kind to your stomach. Choose food and drink wisely. If stomach upset is violent, see your doctor.
23. See your dentist to prevent pain and control infection.
24. Wear clean clothes—beat the skin game. A shower after work.
25. Know your score—get a physical check-up at least once a year.
26. Beware of carbon monoxide in garages, in foundries, in heating plants.
27. What you don't know can hurt you—get a blood test for syphilis.
28. Night shift. Guard against fatigue by getting plenty of rest and good food.
29. Correct pick-up, avoid hernia.

Community Health Series

*5. Is there a doctor in town? 4 pages. 1944. Out of print. (Obsolete.)

Unnumbered Publications

Index to Public Health Reports, vol. 58, part 2, July–December 1943. 16 pages.
Index to Journal of the National Cancer Institute, vol. IV, August 1943–June 1944. 7 pages.
National Negro Health Week program. This pamphlet is published annually, usually about the middle of March, for community leaders in an effort to suggest ways and means by which interested individuals and organizations may be organized for a concerted and effective attack upon the community's disease problems. Thirtieth observance, April 2–9, 1944. 4 pages.
National Negro Health Week poster. Thirtieth observance. 1944.
National Negro Health Week leaflet. Thirtieth observance. 1944. 2 pages.

Annual Reports

Annual Reports of the Surgeon General of the United States Public Health Service 1941–42, 1942–43. 194 pages.

Reprints From Venereal Disease Information

213. Serial examinations in the epidemiology of gonococcal infections. By Samuel D. Allison, W. L. Zink, and W. S. Ito. Vol. 25, January 1944. 2 pages.
214. Venereal disease and selective service. By Richard H. Eanes. Vol. 25, January 1944. 6 pages.
215. Improvement of present methods for extrafamilial contact tracing. By Mary A. Burke. Vol. 25, January 1944. 5 pages.
216. Criteria of cure in gonorrhea. By Richard A. Koch, Earl N. Mathis, and Jacob C. Geiger. Vol. 25, February 1944. 8 pages.
217. Progress in the wartime management of gonorrhea. By Percy S. Pelouze. Vol. 25, February 1944 4 pages.
218. Combined artificial fever and aldarsone in the treatment of neurosyphilis. By A. E. Bennett, W. H. Morrison, and H. C. Modlin. Vol. 25, March 1944. 8 pages.
219. Gonorrhea: the epidemic we face. By P. S. Pelouze. Vol. 25, March 1944. 5 pages.
220. The one-day treatment of syphilis with fever and mapharsen. By Nathaniel Jones, Charles M. Carpenter, Ruth A. Boak, Stafford L. Warren, and Henry Hanson. Vol. 25, April 1944. 5 pages.
221. A study of the amount of active syphilis found in a group of newly inducted soldiers. By Joe W. Still and Eugene Greenwald. Vol. 25, April 1944. 4 pages.
222. Evaluation of positive Kolmer and Kahn tests in leprosy. By G. H. Faget and Hilary Ross. Vol. 25, May 1944. 5 pages.
223. An evaluation of the blood-dye diluent for the transportation of material from gononoccic infections. By S. Edward Sulkin and Joseph C. Willett. Vol. 25, May 1944. 6 pages.
224. Trichomonas urethritis and prostatitis: A preliminary report on incidence and an analysis of 44 cases of this common venereal infection. By Russell B. Roth. Vol. 25, June 1944. 4 pages.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

The State reports regularly scheduled for this issue will be published in the issue of November 3. This change is necessitated by a new arrangement with the Government Printing Office, whereby the Public Health Reports will, after a brief transition period, appear approximately on its issue date, instead of 2 weeks later, as at present.

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept 30, 1944

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	0	1	1	3	0	0	1
New Hampshire												
Concord	0	0		0	0	0	1	0	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	3	0	0	3
Massachusetts												
Boston	3	0		0	31	4	11	6	22	0	0	13
Fall River	0	0		0	0	0	2	0	0	0	3	6
Springfield	0	0		0	0	0	0	3	1	0	1	0
Worcester	0	0		0	0	0	7	1	4	0	0	12
Rhode Island												
Providence	0	1	1	0	0	1	0	0	3	0	0	18
Connecticut												
Bridgeport	1	0		0	0	0	0	0	0	0	0	1
Hartford	0	0		0	0	0	1	1	0	0	0	2
New Haven	0	0		0	0	1	0	2	0	0	0	15
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	1	6	20	0	0	0	5
New York	6	1	1	0	3	5	47	116	35	0	3	76
Rochester	0	0		0	4	1	1	26	0	0	0	5
Syracuse	0	0		0	0	1	1	1	1	0	0	6
New Jersey												
Camden	0	0		0	0	1	0	1	0	0	0	0
Newark	1	0	1	0	3	0	1	1	4	0	0	19
Trenton	0	0	1	0	0	0	2	1	0	0	0	0
Pennsylvania												
Philadelphia	1	0	1	0	2	4	5	9	13	0	3	14
Pittsburgh	0	0		0	0	1	6	4	7	0	0	4
Reading	0	0		0	0	0	1	0	0	0	0	0

City reports for week ended Sept 30, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
EAST NORTH CENTRAL												
Ohio,												
Cincinnati	0	0		0	0	0	2	9	15	0	0	4
Cleveland	0	0	5	0	2	4	5	15	20	0	1	21
Columbus	0	0		0	0	0	2	1	2	0	0	10
Indiana												
Fort Wayne	0	0		0	0	0	2	0	0	0	1	0
Indianapolis	5	0		1	0	0	3	1	3	0	0	3
South Bend	0	0		0	1	0	0	0	3	0	0	0
Terre Haute	0	0		0	0	0	4	0	2	0	0	2
Illinois,												
Chicago	1	0		1	7	3	16	14	19	0	2	48
Springfield	0	0		0	1	1	0	1	3	0	0	0
Michigan												
Detroit	3	0		0	3	4	15	19	20	0	1	56
Flint	0	0		0	0	0	[illegible]	0	0	0	0	0
Grand Rapids	0	0		0	1	0	2	0	2	0	0	1
Wisconsin,												
Kenosha	0	0		0	0	0	0	0	1	0	0	13
Milwaukee	0	0		0	1	1	6	0	5	0	0	16
Racine	0	0		0	0	0	0	0	0	0	0	1
Superior	0	0		0	2	0	0	2	2	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	1	5	3	0	0	0
Minneapolis	5	0		0	2	0	6	9	8	0	0	4
St Paul	1	0		0	0	0	2	7	2	0	0	21
Missouri												
Kansas City	0	0		0	0	0	6	1	5	0	0	0
St Joseph	0	0		0	0	0	0	0	0	0	1	0
St Louis	0	0	2	0	0	1	12	15	5	0	0	17
North Dakota												
Fargo	0	0		0	0	0	2	0	1	0	0	0
Nebraska												
Omaha	0	0		0	4	0	0	1	0	0	0	0
Kansas												
Topeka	0	0		0	0	0	0	1	3	0	0	0
Wichita	0	0		0	0	0	1	0	4	0	0	0
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	2	6	0	0	0	2
Maryland												
Baltimore	2	0		0	0	0	6	14	10	0	0	38
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0	1	0	1	0	1	9	9	0	2	1
Virginia												
Lynchburg	0	0		0	0	0	0	3	5	0	0	1
Richmond	0	0	1	1	0	0	1	3	2	0	0	0
Roanoke	0	0		0	0	0	1	2	0	0	0	0
West Virginia												
Charleston	0	0		0	0	0	0	0	0	0	0	0
Wheeling	0	0		0	1	0	2	0	0	0	0	2
North Carolina												
Raleigh	0	0		0	0	0	0	0	2	0	0	1
Wilmington	1	0		0	0	0	0	0	0	0	0	1
Winston Salem	1	0		0	1	0	1	0	6	0	0	0
South Carolina												
Charleston	0	0		0	0	0	0	1	0	0	1	0
Georgia												
Atlanta	0	0	9	1	0	0	4	2	4	0	0	1
Brunswick	0	0		0	1	0	0	0	0	0	0	0
Savannah	0	0		0	0	0	0	0	2	0	0	0
Florida												
Tampa	1	0		0	0	0	2	0	1	0	0	0

City reports for week ended Sept 30, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
EAST SOUTH CENTRAL												
Tennessee												
Memphis	2	0		0	1	1	4	0	5	0	2	7
Nashville	0	0		0	0	0	2	0	4	0	0	0
Alabama												
Birmingham	0	0	1	0	0	0	3	0	2	0	0	0
Mobile	0	0	1	0	0	2	1	0	4	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	1	0	1	0	0	1
Louisiana												
New Orleans	3	0	2	0	0	2	7	2	5	0	0	3
Shreveport	3	0		0	0	0	1	1	0	0	0	0
Texas												
Dallas	5	0		0	0	0	1	0	5	0	0	0
Galveston	1	0		0	0	0	0	0	2	0	0	0
Houston	1	0		0	0	0	4	1	1	0	2	3
San Antonio	1	1	1	2	1	0	6	0	0	0	1	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	0	1	0	0	1	2
Great Falls	0	0		0	1	0	0	0	2	0	1	0
Helena	0	0		0	0	0	0	0	0	0	0	2
Missoula	0	0		0	0	0	2	0	0	0	0	0
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	5	0	5	0	1	1	4	1	4	0	0	4
Pueblo	0	0		0	0	0	4	0	1	0	0	2
Utah												
Salt Lake City	0	0		0	2	0	0	0	3	0	0	4
PACIFIC												
Washington												
Seattle	0	0		1	0	0	0	4	4	0	0	0
Spokane	0	0		0	0	0	1	0	0	0	0	0
Tacoma	0	0		0	0	1	0	0	0	0	1	2
California												
Los Angeles	6	0	3	0	6	2	3	0	11	0	2	11
Sacramento	0	0		0	1	2	0	0	5	0	0	0
San Francisco	4	0	2	1	15	1	5	0	6	0	0	1
Total	63	3	38	8	100	46	255	344	330	0	29	506
Corresponding week, 1943	60		28	13	253		263		500	0	29	875
Average, 1939–43	67		44	[1] 12	[2] 173		[1] 257		360	0	36	989

[1] 3 year average, 1941–43
[2] 5-year median, 1939–43

Dysentery, amebic —Cases Boston, 1, Baltimore, 1, Houston, 1, Los Angeles, 1
Dysentery, bacillary —Cases Buffalo, 6, New York, 9, Rochester, 2, Chicago, 1, Detroit, 6, St Louis, 4, Baltimore, 1, Charleston, S C, 11, Atlanta, 1 Los Angeles, 2
Dysentery unspecified —Cases Richmond, 2
Rocky Mountain spotted fever —Cases Richmond, 1
Tularemia —Cases Cleveland, 1
Typhus fever, endemic —Cases Wilmington, N C, 3 Atlanta, 3, Savannah, 10, Tampa, 4 Nashville, 10, Birmingham, 1, Mobile, 4, New Orleans, 3, Shreveport, 1, Dallas, 2, Galveston, 3, Houston, 4, San Antonio 1

Rates (annual basis) per 100,000 population, by geographic groups for the 90 cities in the preceding table (estimated population, 1943, 34,394,800

	Diphtheria case rates	Encephalitis infectious case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	10.5	2.6	2.6	0.0	81	15.7	60.1	36.6	94	0.0	10.5	186
Middle Atlantic	3.7	0.5	1.9	0.0	6	6.5	32.4	82.8	28	0.0	2.8	60
East North Central	5.5	0.0	3.0	1.2	11	7.9	38.3	37.7	59	0.0	3.0	106
West North Central	11.9	0.0	4.0	0.0	12	2.0	59.7	77.6	62	0.0	2.0	94
South Atlantic	8.2	0.0	18.0	3.3	7	0.0	32.7	65.4	67	0.0	4.9	77
East South Central	11.8	0.0	11.8	0.0	6	17.7	59.0	0.0	89	0.0	11.8	41
West South Central	40.2	2.9	8.[illegible]	5.7	3	5.7	57.4	11.5	40	0.0	8.6	20
Mountain	39.7	0.0	39.7	0.0	32	7.9	79.4	15.9	79	0.0	15.9	111
Pacific	15.8	0.0	7.9	3.2	35	9.5	14.2	6.3	41	0.0	4.7	22
Total	9.6	0.5	5.8	1.2	15	7.0	38.6	52.3	50	0.0	4.4	77

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 16, 1944.—During the week ended September 16, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		5		22	44	6	2	12	21	112
Diphtheria	1	3	2	36	8	4	1			55
Dysentery (amebic)					3					3
Dysentery (bacillary)				30						30
German measles				4	6		1		7	18
Influenza					9				14	23
Measles		1		24	9	4	3	6	8	55
Meningitis, meningococcus			1						2	3
Mumps				21	19	2	1	15	16	74
Poliomyelitis		1	4	4	27	11		11	1	59
Scarlet fever		2	6	44	59	14	4	7	*14	150
Tuberculosis (all forms)		42	6	192	62	20			33	355
Typhoid and paratyphoid fever				36	1	1	1		3	42
Undulant fever				9	1			1		11
Whooping cough		23	1	93	69	9	23	27	32	277

JAMAICA

Notifiable diseases—4 weeks ended September 23, 1944.—During the 4 weeks ended September 23, 1944, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Leprosy		1
Chickenpox	2	5	Tuberculosis	39	65
Diphtheria	7	6	Typhoid fever	12	84
Dysentery		2	Typhus fever	3	
Erysipelas		2			

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK[1]

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Algeria—Algiers.—For the month of September 1944, 29 cases of plague with 5 known deaths were reported in Algiers, Algeria. All precautionary measures have been taken.

Belgian Congo—Stanleyville Province.—Plague has been reported in Blukwa region of Stanleyville Province, Belgian Congo, as follows: Week ended September 16, 1944, 2 deaths; week ended September 30, 1944, 5 deaths.

Bolivia.—For the month of August 1944, 5 cases of plague were reported in Santa Cruz Department, and 3 cases of plague with 1 death were reported in Tarija Department, Bolivia.

Brazil.—Plague has been reported in Brazil as follows: January 1 to March 31, 1944, 89 cases with 17 deaths. For the month of April 1944, 5 cases of plague were reported in Brazil by States as follows: Alagoas, 1 case; Bahia, 1 case; Ceara, 3 cases.

Madagascar—Tananarive.—For the month of August 1944, 11 cases of plague with 9 deaths were reported in Tananarive, Madagascar.

Union of South Africa—Cape of Good Hope Province—Saint Marks.—A report dated October 4, 1944, states that during the past week 13 deaths from plague had been reported among natives in Saint Marks about 160 miles northeast of Port Elizabeth, Cape of Good Hope Province, Union of South Africa.

Smallpox

Bolivia.—For the month of August 1944, 180 cases of smallpox with 57 deaths were reported in Bolivia. Departments reporting the highest incidence are: Chuquisaca, 7 cases, 2 deaths; La Paz, 70 cases, 30 deaths; Potosi, 89 cases, 23 deaths.

Mexico.—For the month of August 1944, 277 cases of smallpox were reported in Mexico. States reporting the highest incidence are: Aguascalientes, 46 cases; Hidalgo, 43 cases; Oaxaca, 58 cases; Vera Cruz, 63 cases.

Turkey.—For the month of July 1944, 78 cases of smallpox were reported in Turkey.

[1] The monthly cumulative table regularly published in the last issue of each month will appear in the next issue.

Typhus Fever

Algeria.—For the period August 11–20, 1944, 12 cases of typhus fever were reported in Algeria.

Bolivia.—For the month of August 1944, 26 cases of typhus fever with 4 deaths were reported in Bolivia. Departments reporting the highest incidence are: Cochabamba, 7 cases; La Paz, 8 cases, 2 deaths; Potosi, 8 cases, 2 deaths.

Hungary.—For the week ended September 9, 1944, 21 cases of typhus fever (including 15 cases in Subcarpathia) were reported in Hungary.

Mexico.—For the month of August 1944, 109 cases of typhus fever were reported in Mexico. States reporting the highest incidence are: Mexico, D. F., 24 cases; Mexico, 22; Nuevo Leon, 17; Queretaro, 11 cases.

Rhodesia (Northern).— For the week ended August 19, 1944, 10 cases of typhus fever were reported in Northern Rhodesia.

Turkey.—For the month of July 1944, 210 cases of typhus fever were reported in Turkey.

Yellow Fever

Belgian Congo Stanleyville Province—Babeyru.—For the week ended March 11, 1944, 1 fatal case of yellow fever was reported in Babeyru, Stanleyville Province, Belgian Congo.

Gold Coast.—For the week ended July 29, 1944, 1 case of yellow fever was reported in the northern territories of Gold Coast.

Venezuela—Tachira State—San Camilo (vicinity of).—For the period September 6–15, 1944, 3 cases of yellow fever were reported in the jungle area in the vicinity of San Camilo, Tachira State, Venezuela. A telegraphic report, dated September 27, states that 2 additional cases of yellow fever were reported from this same area.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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Public Health Reports

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U.S. PUBLIC HEALTH SERVICE 1798

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THE INFECTIVITY OF MYCOBACTERIA FOR CHORIOALLANTOIC MEMBRANES OF CHICK EMBRYOS[1]

By George L. Fite, *Surgeon (R)*, and Byron J. Olson, *Surgeon, United States Public Health Service*

This article presents the results of inoculating 46 strains of acid-fast bacilli on the chorioallantoic membranes of chick embryos, to determine what value the procedure may have in throwing light upon the apparent virulence of these organisms. Emmart and Smith (*1*) have suggested that an estimate of the virulence of a given strain of tubercle bacilli may be determined by the extent of the lesions produced in this manner. Moore (*2*), using the chorioallantoic membranes for comparing strains of bacilli from human, bovine, avian, fish, and snake tuberculosis, states, "Certainly, virulence can be determined without difficulty."

MATERIALS

A. Twenty-four strains of human tubercle bacilli were isolated during the past few years from sputums of cases of tuberculosis in Alabama, Tennessee, and Virginia, which have been the subject of continuing epidemiologic studies by the Public Health Service. One strain, B–106, originated in Hawaii. One strain (TF) was obtained from an autopsy in Tennessee by Dr. T. H. Tomlinson. All these are culturally typical.

B. One strain (6–LC) was from the sputum of a case from Alabama, but is smooth or intermediate in cultural appearance. All the organisms in these two groups, 27 strains altogether, have been found to possess some degree of virulence for guinea pigs, and the term "virulence" as used in this article refers strictly to virulence for guinea pigs.[2]

C. Strain R–1, culturally of the human type, avirulent for guinea pigs.

[1] From the Pathology Laboratory and the Division of Infectious Diseases, National Institute of Health.

[2] Studies of the virulence of these strains will be the subject of a later report.

D. Two strains of avian tubercle bacilli, one obtained from the Phipps Institute, the other (C–1) from Dr. A. B. Crawford, Beltsville, Md.

E. *M. tuberculosis bovis*, Phipps Institute No. 523.

F. Two strains of mycobacteria, nonchromogenic, smegma type (*S*), B–102 and B–105.

G. Thirteen chromogenic strains:

1. Lleras Acosta's "lepra" bacillus, B–108.
2. From cases of leprosy, 2 strains, B–35, B–103 (*S*).
3. Four strains from sputums, from Dr. A. W. Bengston, Catawba Sanitarium, Va., V–43, V–78, V–106, V–136.
4. Five strains from sputum of cases in the Public Health Service series.
5. One strain from an autopsy in Tennessee by Dr. T. H. Tomlinson, TI–1B.

METHODS

Weighed and measured doses of bacilli grown on egg media and ground in a ball mill in 0.9 percent saline solution were used in all cases, and live bacillus plate counts, some of which failed for irrelevant reasons, were used to check viability and provide information as to the significance of the living status of the organism. Also for this purpose, duplicate 1.0 mg. doses of the same suspensions of many strains were used, after heating 30 minutes at 115° C. Subsequent culture of the autoclaved suspensions uniformly gave no growth.

Doses varying from 5.0 mg. to 0.01 mg. in 0.2 cc. saline were used. The doses of 1.0 and 0.01 mg. were adopted as standards as they were found to represent: (*a*) the minimum level which consistently produced large lesions in a majority of the membranes inoculated with virulent organisms, and (*b*) the level which still produced some lesions with the virulent organisms, but little or nothing with others.

The eggs were inoculated with a hypodermic needle through the shell membrane, after removing a small segment of shell and separating the membrane by suction over the air sac. The eggs were inoculated after 9 days' incubation and harvested 6 days later. A few comparative tests using 11- and 12-day eggs, or varying the period of the experiment from 5 to 9 days, indicated that the variations observed were not important. Technical failures and death of embryos for unknown reasons resulted in the discarding of 893, or 36 percent, of 2,472 eggs. The yield improved somewhat with practice, although it appeared that occasional or seasonally inferior batches of eggs contributed.

Of the 1,579 membranes harvested, 12 are omitted from the tables. Sections were made of all membranes showing grossly visible lesions, but it was not found profitable to section all membranes in some

groups; 1,346 of 1,567 were sectioned. Of these, 932 showed lesions. Thirteen membranes showed lesions obviously nontuberculous; 104 showed lesions of the ectoderm only, mostly distributed widely among membranes receiving 0.01 mg. doses; 815 showed mesodermal lesions containing acid-fast bacilli.

Moore, using a loop to inoculate the eggs through a larger window, observed only a small number in each series inoculated with human bacilli remaining alive, and usually death of the embryo within 5 days using avian bacilli. He probably used larger doses than were used here, but it is not possible from the present studies to show that inoculation of any of the mycobacteria used, in spite of the presence of large gross lesions, leads to the death of the embryo within 6 days after inoculation. Although there were some series with few survivals, there were others with high survival rates, and there was no essential difference between the rates with virulent, avirulent, or killed organisms where the dose was 1.0 mg With the 5.0 mg. dose, the data are insufficient, but the lesions seen were barely more extensive than those at 1.0 mg.

ANATOMIC CHANGES

Emmart and Smith illustrated the characteristic lesions caused by human tubercle bacilli, conglomerate large tubercles, or, in addition, many small nodules or tubercles scattered over the membrane. Nearly all the organisms studied here produced nodules of varying size, with the human strains frequently conglomerate and large, measuring 1.0 cm. or more in diameter. Scattered small foci were also common, often in addition to a main large nodule, but only infrequently with larger doses constituted the sole lesions. With dead bacilli a main lesion with much edema was usually the principal change. Occasional groups of membranes (e. g., those inoculated with 130–RP) showed large edematous blebs on the under surface of the membranes.

There was much variation in size of the lesions in individual membranes in a given series receiving the same material, but with the virulent human strains at 1.0 mg. there were usually 40 to 50 percent of the membranes with large lesions. These large nodules had a pronounced tendency to occur at the juncture of large vessels. They did not project above the surface, but on the contrary bulged into the fluid beneath. Lesions other than these main lesions (in the mesoderm) were by no means uncommon, yet occasionally membranes were delicate and devoid of lesions except for the main one. Scattered foci of varying size rarely were so numerous as to be nearly confluent, and in some membranes there was a ring of foci at the juncture of the separated membrane with the shell. It seemed that the mechanical factors involved in the settling of the inoculated fluid determined in part the gross distribution of the lesions. Smaller lesions resulting from large doses were identical with those seen with the 0.01 mg. dose.

HISTOLOGIC CHANGES

The reactions of the ectoderm, proliferation of ectodermal cells, and appearance of mononuclear cells and granulocytes phagocytosing bacilli have been described by others. With the dose of 0.01 mg. of virulent organisms, it was often possible to observe the migration of bacilli through the ectoderm, to produce superficial mesodermal foci, after piling up in ectodermal cells. Groups of organisms in the ectoderm, suggesting small colonies infiltrated by exuding cells, were seen many times but too frequently with dead organisms to attach much importance to them. On the whole, the ectodermal changes appear unimportant compared with those of the mesoderm, and growth of bacilli on the ectoderm has not been shown to occur.

Moore described the histologic differences of the lesions produced by various types of tubercle bacilli, with which our findings are in general in agreement. The human organisms produce large mesodermal lesions which are essentially masses of tuberculous granulation tissue with widely scattered bacilli, mostly intracellular. The cellular reaction was not particularly heavy in view of the large numbers of bacilli which appear to be multiplying rapidly.

The avian and bovine strains, on the other hand, produced compact lesions in which nearly all of the bacilli are found intracellularly, filling and stuffing macrophages, even as they do in animals, with comparatively little other cellular response.

Marked differences in histologic character of the lesions produced by dead and by living organisms were observed. Although the response of the tissues was never as great as with living bacilli, the changes produced show that killed organisms may occasionally produce moderately extensive lesions. The response to dead bacilli is in many ways like that to the avian, except that the cellular response is minimal, and edematous fluid accounts for a good part of the lesion.

The character of the cells responding to avian bacilli has been delineated in detail by Canat and Opie (*4*) who found most of the added cells to be derived from or generated within the membrane itself. Cells with numerous acidophilic granules in their cytoplasm, which Emmart and Smith called eosinophiles, were found by Canat and Opie to be cells in various stages of development from hemocytoblasts into granulocytes, many of them being myeloblasts. These cells have been found in the present series frequently, but in most irregular fashion. They were seen almost regularly in considerable numbers in lesions caused by many of the chromogenic bacilli, to a lesser but still important degree in the dead bacillus and avian lesions, and inconsistently intermingled in groups with the histiocytes of the lesions caused by human type organisms.

The large nodular lesions, microscopically, are for the most part clusters of numerous small foci, which are not wholly discrete but may

fuse to show a solid lesion. Table 1 analyzes the distribution of foci in the 815 membranes with lesions of the mesoderm, irrespective of other factors.

TABLE 1.—*Type and extent of lesions*

Principal type of lesion	Total	Size of main lesion			
		Large	Medium	Small	None
Solid	82	52	24	6	0
Clusters	444	85	155	200	4
Scattered foci	278	1	20	72	185
Other	11	0	0	0	11
Total	815	138	199	278	200

Table 1 does not show that the "scattered foci" are for the most part the lesions of lesser doses, killed, or avirulent bacilli. Nor does it indicate that actually many of those in which the main lesion was a cluster of foci also had scattered foci.

Epithelioid cells were seen in 68 of 815 membranes. They were found in the lesions caused by strain 160–KD, an organism of high virulence for guinea pigs, although absent from lesions caused by other human strains except in trivial numbers or isolated instances. A majority of the 68 membranes showing epithelioid cells were scattered here and there among lesions caused by chromogenic bacilli, and those of slight animal virulence. Their occasional occurrence suggested that 6 days might not be sufficient time for full development, yet in a number of eggs with 9-day lesions caused by virulent bacilli, they were still not present. Canat and Opie's remark, "The lesion that is formed by proliferation of fibroblasts and accumulation of mononuclear phagocytes does not resemble a tubercle because it lacks the epithelioid cells that give the tubercle its characteristic form," applies to the present results, with few exceptions.

Giant cells were seen in 167 of 815 membranes showing mesodermal lesions. These appear to be of two types, one of which consists of foreign body type giant cells, which show beginning fusion of mononuclear cells and are ill-developed. Most are of the other type which Moore illustrated, and appear to be formed of ectodermal cells about invaginations, which not infrequently show mitotic figures.

TABLE 2.—*Giant cells*

Giant cells		Ectodermal invaginations	
		Present	Absent
Present	167	161	6
Absent	648	306	342

The frequency of the ectodermal invaginations, present in 467 of 815 membranes with lesions, results inevitably in their producing changes which contribute to the picture, even though they do not play an essential role. They occurred with all types of lesions, all doses, living and dead bacilli, and have been described in membranes receiving entirely different treatments. They are not necessarily an abnormality, occurring to a small degree in membranes that have been separated but not otherwise treated. In the membranes inoculated with acid-fast bacilli, the bacilli are often seen carried with the invaginations into the mesoderm, as the membrane thickens with the extravasation of edema fluid. There is much overlapping in table 3,

TABLE 3 — *Ectodermal invaginations*

Type of invaginations	Number
Without enclosed bacilli	169
With bacilli, but no cellular response	168
With bacilli, and with cellular response	186
With bacilli, with cellular response and necrosis	123

as many membranes showed more than one type of invagination. Invaginations which enclose pockets of bacilli commonly show no other cellular reaction, particularly with the chromogenic mycobacteria.

All stages of "necrosis" associated with the invaginations are seen This begins with the infiltration of segmented leucocytes between the ectodermal cells of the invagination, which collect in increasing numbers in the center, distending the ring of ectodermal cells, which steadily multiply to continue as a layer about the necrotic center There is no fibrous tissue or organization within the area, but the necrotizing process goes beyond the ectodermal wall into the mesoderm proper, so that the ectodermal cells originally present may be destroyed, although they are often preserved except around the largest areas of necrosis. That these areas of necrosis in the mesoderm are almost wholly dependent upon the invaginations is suggested in table 4.

TABLE 4 — *Membranes showing invaginations*

	Number of membranes	
	With invaginations	Without invaginations
Number of membranes	467	348
Number with necrosis	170	22
Percent	36 4	6 3

The designation of these areas as "caseation necrosis" by Emmart and Smith (*1*) and Moore (*2*) appears misleading in implying a similarity to the manner in which necrosis is produced in tubercules in animals and

man. Ulcerations of the ectodermal surface of large nodules result from the extension or communication of the necrotic areas to the surface. With the chromogenic strains, V-43 and V-78, broad shallow ulcers above a fibrous base were common, with mixtures of both acid-fast and nonacid-fast forms of bacilli in the debris.

In the mesodermal lesions, the close application of bacilli, or bacillus-containing cells, to small blood vessels is often striking, but organisms are seen within the endothelial cells of these vessels only rarely. The viscera of the embryos of the eggs inoculated with strain 14-TF were searched for tubercle bacilli, with the result that in those inoculated with 5.0 and 1.0 mg., 13 of 14 examined revealed bacilli, principally in the liver in portal areas and in endothelial or Kupffer cells, like those described by Canat and Opie following intravenous inoculation. The absence of a cellular response to the bacilli within the embryo is notable. Bacilli have been seen about vessels of the yolk in a number of odd instances when that tissue was examined, but in some of these there were also bacilli in the entodermal cells of the chorioallantois, showing that the needle rarely went through the membrane, probably the only circumstance which leads to the presence of bacilli in the entoderm.

The significance of the lesions of egg membranes is affected by the viability of the organisms. The live-organism counts and heat-killed controls show that the extensive large lesions produced by the highly virulent (for guinea pigs) human strains are dependent on living bacilli, which probably applies also to other organisms in all doses. It is nonetheless curious that the largest lesions produced by any of the heat-killed organisms were consistently caused by killed bacilli of the most highly virulent human type. The impression is gained, from comparison of "dead" and "live" lesions, that with the living virulent organisms extensive reproduction of bacilli has taken place, in sharp contrast to the chromogenic organisms, although these latter grow with great rapidity on simple artificial media.

In table 5 the character of the lesions, which is not always uniform for all eggs receiving the same inoculum, is called *human*, *avian*, or *dead* (on the basis of the general character as a whole), or "mixed" to indicate equally prominent but variable features. The virulent organisms are most consistent in producing uniform lesions of the "human" type, while the human tubercle bacilli of less than maximal virulence commonly produce some features of the "avian" or "dead" type. In lesions caused by the chromogenic bacilli, there are not infrequently areas which are indistinguishable from those caused by the human strains. It has not been found easy to classify the lesions in many membranes, perhaps because there are always present in the cultures, proportionate to their age, numbers of nonviable bacilli. The occurrence of "dead" foci among otherwise "human" type lesions may be

TABLE 5.—*Lesions produced in chorioallantoic membranes by mycobacteria*

18 CULTURALLY TYPICAL STRAINS OF *M. tuberculosis hominis* OF PROVEN VIRULENCE FOR GUINEA PIGS

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg.	Dose in mg.	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
TF	20	11	20	5,200,000	1.0	9	9	Human	+++	Human	+++
14-IF	27	19	23	4,200,000	5.0	4	4	do	+++	Human	+++
					1.0	21	21	do	+++		
					0.01	12	9	do	+		
16-TG	44				1.0	8	8	do	+++	Human	+++
					0.01	13	7	do	++		
					1.0 K	11	6	Dead	++		
18-JG	32	19	6	4,800,000	1.0	15	15	Human	+++	Human	+++
					0.01	11	5	do	+		
	33	3	708	0	1.0	20	11	Dead			
					0.01	14	0				
53-JLW	38	7	21	4,600,000	1.0	13	13	Human	+++	Human	+++
					0.01	22	20	do	++		
55-SA	31	14	22	2,700,000	1.0	13	13	Human	+++	Human	+++
					0.01	7	7	do	+		
	33	11	526	13,000	1.0	20	5	Dead	+		
					0.01	11	0				
56-JG	35	18	23	5,400,000	5.0	2	2	Human	+++	Human	+++
					1.0	3	3	do	+++		
					0.01	8	5	do	+++		
	37	19			1.0	18	18	do	+++		
112-HK	17	10	35	4,500,000	1.0	7	7	do	+++	Human	+++
					0.01	3	3	do	+		
	18	11	7	800,000	1.0	16	15	do	+++		
					0.01	14	10	do	+		
	19	2	515	63,000	1.0	5	0				
					0.5	3	0				
					0.01	3	0				
109-LXS	11	6	15	4,400,000	1.0	11	11	Human	+++	Human	+++
					0.01	15	0				
	19	11	27	3,400,000	1.0	9	9	Human	+++		
					0.01	11	9	do	+		
	20	2	496	30,000	1.0	18	5	Dead	MIN		
					0.01	13	0				
114-CI	19	10	18	1,700,000	1.0	6	6	Human	+++	Human	+++
					0.01	3	1	do	++		
					1.0 K	4	4	Dead	+		
30-RP	22				1.0	10	10	Human	++	Human	+
					0.1	4	4	Mixed	++		
					0.01	6	0				
132-RK	8	4	12	1,500,000	1.0	16	11	Human	++	Human	+
					0.1	5	3	ECT			
					0.01	9	3	Mixed	+		
137-JB	12	6	33	11,000,000	1.0	11	11	Human	+++	Human	+++
					0.01	11	9	do	+++		
160-KD	15	4	16	400,000	1.0	13	12	do	+++	Human	+++
					0.01	10	4	do	+		
					1.0 K	11	6	Dead	+		
166-MXS	11	5	61	1,300,000	1.0	7	7	Human	++	Human	+++
					0.01	9	8	do	++		
177-WXB	11	2	63	1,000,000	1.0	12	10	do	+++	Human	+++
					0.01	8	5	do	++		
					1.0 K	10	9	Dead	++		

TABLE 5.—*Lesions produced in chorioallantoic membranes by mycobacteria*—Con.

A. 18 CULTURALLY TYPICAL STRAINS OF *M. tuberculosis hominis* OF PROVEN VIRULENCE FOR GUINEA PIGS—continued

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
198-ARB	9	3	36	400 000	1.0	7	7	Human	++	Human	+
					0.01	8	4	do	+		
						9	5	Dead	+		
199-RB	7	3	43		1.0	9	9	Human	+++	Human	+++
					0.01	12	11	do	+++		
					1.0 K	10	6	Dead	+		
A. 8 CULTURALLY TYPICAL STRAINS OF *M. tuberculosis hominis*, OF INTERMEDIATE OR LOW VIRULENCE FOR GUINEA PIGS											
34-CP					1.0	8	5	Human	++	Human	+
					0.01	12	4	Dead	+		
					1.0 K	15	7	do	++		
B 106	50		13		1.0	8	4	Human	+	Human	+
					0.01	12	3	?	MIN		
						6	5	Dead	+		
108-HB	16	3	15	800 000	1.0	7	6	do	MIN	AVIR	0
					0.1	1	0				
					0.01	1	0	Dead	MIN		
					1.0 K	5	4	do	MIN		
131-MJD	13	5	68	4 400 000	1.0	11	8	Human	++	Human	+
					0.01	8	2	do	+		
					1.0 K	14	2	Dead	MIN		
167 OXC	8	4	14	2 800 000	1.0	6	6	Mixed	++	Human	+
					0.01	5	4	[illegible]	+		
					1.0 K	4	1	Dead	+		
171 CXG	12	2	45	400 000	1.0	7	6	Mixed	++	Human	+
					0.01	9	3	do	+		
					1.0 K	6	0				
178-JI	5	3	21	5 600 000	1.0	[illegible]	5	Human	+++	Human	+++
					0.01	11	7	do	++		
					1.0 K	9	7	Dead	++		
183-XLG	11	4	45	2 400 000	1.0	7	7	Human	+++	Human	+++
					0.01	10	9	do	+		
					1.0 K	9	5	Dead	+		
B. 1 CULTURALLY SMOOTH STRAIN OF *M. tuberculosis hominis*, OF LOW VIRULENCE FOR GUINEA PIGS											
6-LC	36	21	9	1 000 000	1.0	4	4	Human	+++	Human	+++
					0.01	2	0				
					1.0 K	9	3	Dead	+		
C. 1 CULTURALLY TYPICAL STRAIN OF *M. tuberculosis hominis*, AVIRULENT FOR GUINEA PIGS											
R-1	300+		29		1.0	11	9	Human	+++	Human..	+++
					0.01	6	6	do	++		
					1.0 K	2	2	Dead	++		

Table 5.—*Lesions produced in chorioallantoic membranes by mycobacteria*—Con.

D. 2 STRAINS OF *M. tuberculosis avis*

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
Av Phipps			13		1.0	22	7	Avian	+	Avian	+
			11	5 100 000	1.0	16	13	do	++		
					0.01	16	8	do	+		
			29	4 300 000	1.0	16	13	do	++		
					0.01	12	5	do	+		
					1.0 K	15	13	do	+		
Av C-1	26	18	18		1.0	13	9	do	++	Avian	+
					0.01	3	3	do	+		
	28	20	35	50 000 000	1.0	8	6	do	++		
					0.01	4	0				

E. 1 STRAIN OF *M. tuberculosis bovis*

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
PH-523			19	1 400 000	1.0	15	12	Avian	++	Avian	+
					0.01	5	1	ECT			
			17		1.0	4	1	ECT			

F. 2 STRAINS OF *M. smegmatis*

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
B-102	60		9	50 000 000	1.0	11	6	Dead	+	AVIR	0
					0.01	12	8	Mixed	MIN		
					1.0 K	8	3	Dead	MIN		
B-105	56		45	21 700 000	1.0	7	4	ATYP	++	AVIR	0
					0.01	2	1	Dead	+		
					1.0 K	3	3	Dead	+		
	56		16	37 500 000	1.0	6	5	Avian	+		
					0.01	7	0				
					1.0 K	7	5	Dead	+		

G. 13 STRAINS OF AVIRULENT CHROMOGENIC MYCOBACTERIA

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
B-108	60		9	56 000 000	1.0	7	5	Mixed	+	AVIR	?
					0.01	1	0				
					1.0 K	10	6	Dead	++		
B-35	100?		6	2 000 000	1.0	8	3	ECT		AVIR	0
					0.01	7	3	ECT			
					1.0 K	12	0				
B-103	60				1.0	13	9	Mixed	+	AVIR	
					0.01	20	1	ECT	MIN		
					5.0 K	6	4	Dead	MIN		
					1.0 K	3	0				
V-43	36	11			1.0	15	5	ATYP	++	ATYP	+
					0.01	6	0				
	38	16	23	3 400 000	1.0	6	6	Mixed	+++		
					0.01	10	1	do	MIN		
					1.0 K	8	8	Dead	MIN		
V-78					2.0	6	0			ATYP	+
					1.0	11	4	ATYP	+		
	32	11	26	106 000 000	1.0	24	21	do	++		
	35	15	11		1.0	2	2	do	+		
					0.01	15	0				
					1.0 K	7	1	ATYP	MIN		
V 106	36	11	38	------	1.0	8	8	Human	+++	Human	+
					0.01	7	4	Mixed	+		
					1.0 K	5	5	do	++		

TABLE 5.—*Lesions produced in chorioallantoic membranes by mycobacteria*—Con.

G. 13 STRAINS OF AVIRULENT CHROMOGENIC MYCOBACTERIA—continued

Strain number	Months between isolation and use	Number of subcultures	Age of subculture in days	Plate count viable organisms per mg	Dose in mg	Membranes: Number harvested	Membranes: Number with lesions	Lesions: Type	Lesions: Extent	Type of organism as judged from membranes	Degree of infectivity for membranes
V-136	40			.	1.0	7	6	ATYP	+++	ATYP	++
	36	11	36	3,300,000	1.0	8	6	do	++		
					0.01	10	1	Dead	MIN		
					1.0 K	4	4	do	+		
61-CNS-A	30	19	23	1,400,000	1.0	13	8	do	MIN	AVIR	0
					0.01	14	2	ECT			
					1.0 K	9	4	Dead	+		
	30	19	25		1.0	7	1	do	MIN		
					0.01	12	0				
					1.0 K	8	0				
82-MA	25	19	28	69,000,000	2.5	3	3	Avian	+++	Avian ?	+
					1.0	2	2	do	++		
					0.01	3	3	ECT			
	25	6	600		1.0	14	13	Dead	++		
					0.01	10	0				
					1.0 K	7	5	Dead	+		
	27	21	8	25,500,000	1.0	11	8	Mixed	++		
	27	22	6	54,000,000	1.0	13	12	do	++		
					0.01	11	2	Dead	+		
					1.0 K	6	6	do	MIN		
185-GD	7	4	28	135,000,000	1.0	12	11	Mixed	+	AVIR	0
					0.01	5	2	do	+		
					1.0 K	6	4	Dead	++		
211-MMK	5	4	15	12,900,000	1.0	11	5	do	+	AVIR	0
					0.01	6	0				
					1.0 K	5	5	Dead	+		
212-AGAW	½	1	17	15,700,000	1.0	14	14	Mixed	++	?	?
					0.01	8	4	Dead	MIN		
					1.0 K	5	3	do	MIN		
	1½	2	15	22,500,000	1.0	8	3	Mixed	+		
					1.0 K	8	4	Dead	+		
	3	3		-	1.0	8	5	Mixed	++		
					0.01	11	3	Human	+		
					1.0 K	7	3	do	MIN		
TI-IB	25	13	21	21,500,000	1.0	8	8	Mixed	++	?	+
					0.01	11	1	Dead	MIN		

ECT=Lesions in ectoderm only
AVIR=Avirulent
K=Heat killed
MIN=Minimal
ATYP=Atypical

attributed to this source. Several aged cultures with few living bacilli produced lesions identical with those from killed organisms.

INFECTIVITY OF MYCOBACTERIA FOR EGG MEMBRANES COMPARED WITH INFECTIVITY OR VIRULENCE FOR GUINEA PIGS

A. *Human tubercle bacilli, virulent for guinea pigs.*—The human organisms of proven virulence for guinea pigs, as the tables show, produced lesions in the egg membranes which agreed fairly well with what is known of the virulence of these strains for guinea pigs. The accurate estimation of virulence of a given strain for guinea pigs is not easy, and for present purposes the organisms were divided into a

group of comparatively high virulence and another of intermediate to low virulence. In making this arrangement, the higher order of virulence was favored; any error lies in having assigned a higher order of virulence than was justified, although recognizing that in all probability there are many grades thereof. However, two of the virulent strains, one of which (198–ARB) is of a high order of virulence for guinea pigs, produced lesions in egg membranes of a distinctly lesser degree and character, and must be rated as being in apparent disagreement. Of the 8 strains of intermediate guinea pig virulence, the lesions in egg membranes were comparable in 5. Of the 3 exceptions, 1 (108–HB) is an organism of low virulence for guinea pigs, also producing some, but not extensive, lesions in rabbits, and the membranes inoculated with this strain showed practically identical lesions with either living or dead bacilli. Strain 6–LC, a smooth organism of low virulence for guinea pigs, produced good lesions in the membranes, like those of the highly virulent human type.

The agreement is in some ways good. Several of the strains of outspoken guinea pig virulence produced most of the largest lesions seen in egg membranes, and the impression was gained that with these strains of the highest order of guinea pig virulence, the egg membranes are reliable indicators, but that with decreasing infectivity for guinea pigs, it becomes increasingly difficult to judge from the lesions of the egg membranes what to expect of the organism elsewhere, although in a majority of strains there was apparent agreement.

Yet the question is thrown into bold relief by the experience with the strain R–1, which has an ancient and hoary history of avirulence for guinea pigs, confirmed by our own animals. On the basis of the egg membrane test, this organism would have to be classed with the organisms of high guinea pig virulence.

B. *Avian and bovine organisms.*—These strains produced lesions which were histologically distinct from those caused by the human organisms and the histologic character of the lesions would enable the distinction of these organisms as a group. It would not be possible to distinguish the bovine from the avian strains, and the question is raised whether with a larger experience there would be found human strains of low virulence which could not be distinguished, because several of the human strains of intermediate guinea pig virulence produced lesions in the chorioallantois in which there was something of the avian character.

C. The *chromogenic mycobacteria* in most cases produced lesions in the egg membranes, which would not be confused with those caused by the human strains of high virulence. Some (211–MMK, 185–GD, 61–CNS) produced lesions indistinguishable from those caused by the killed organisms, or lesions only in the ectoderm (B–35). Strains V–43 and V–78 produced atypical lesions, inconsistently extensive in

some membranes but absent from others, which did not suggest lesions caused by the other mycobacteria. Strain 82–MA (culturally similar to V–78) would be difficult to distinguish from an avian organism, judged by the lesions in the membranes. This strain dissociates into varying colonial types in vitro spontaneously and is like some organisms which French writers of the Calmette school consider avian tubercle bacilli. Strain V–106, on the basis of the lesions in the membranes, would have to be classified as *M. tuberculosis hominis*, which, from its cultural characteristics and lack of guinea pig virulence, it is not. The distinction of strains 212–AGAW and TI–IB from human tubercle bacilli of low or intermediate degrees of guinea pig virulence would hardly be possible on the basis of the lesions in membranes.

DISCUSSION

The brief period of 6 days used to produce the lesions, the immaturity of the "animal" at the time of inoculation, the rapid spread of some bacilli without injuring the embryo, and the exceptions noted, all combine to suggest that, as far as the eggs are concerned, it is not a matter of virulence of the organism, but some other inherent factor, not easy to define except vaguely as an invasive ability or property of the bacilli. The avian strains on a basis of "virulence" might have been expected to show some predilection for growing on or in a medium possessing an avian character. Yet the two strains tested, while producing distinct histologic characteristics, invaded the membranes to a slighter degree than some human strains of intermediate guinea pig virulence. The exceptions make it impossible to believe that, in spite of much general agreement, this procedure is a direct measure of virulence of mycobacteria. The mycobacteria are here free to multiply, invade, and produce lesions in an animal tissue, to a large degree unembarrassed by the complex mechanism of tissue and humoral response, that is, to exhibit some native invasive property. It is not remarkable to see this invasiveness paralleling animal virulence in many instances, but it seems more important to recognize that the growth in chorioallantoic membrane of the egg is a separate phenomenon, more than a cultural characteristic but not a virulence test, which throws light on the character of some strains or species of mycobacteria. A number of the strains subjected to repeated trials gave sufficiently similar results to indicate that the response of the chorioallantois to a given strain and dose thereof was constant.

SUMMARY AND CONCLUSIONS

The results of the implantation of measured doses of 46 strains or species of mycobacteria on the chorioallantoic membranes of chick embryos are given.

Organisms of the highest virulence for guinea pigs consistently produce extensive large characteristic lesions in the mesoderm of the chorioallantois, with rapid growth of the bacilli.

The character of the lesions differs according to the type of organism, the avian and bovine tubercle bacilli producing a lesion histologically distinct from those caused by human tubercle bacilli of the highest guinea pig virulence.

The chorioallantois of the chick embryo varies too greatly in its response to avirulent acid-fast bacilli to make the procedure by itself of value in the determination of the virulence of a given strain or species of organism.

The response of the chorioallantois is constant for a given strain or species of organism; variations are chiefly in degree in individual eggs, not in type or overall extent of the lesions produced.

Small doses of bacilli, .01 mg. or less, are by themselves inadequate to show characteristic changes in the membranes routinely.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

September 10–October 7, 1944

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended October 7, 1944, the number for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—A total of 519 cases of meningococcus meningitis was reported during the 4 weeks ended October 7, as compared with 695 in 1943 and a 5-year median of 107 cases. For the country as a whole, as well as for each geographic section, the number of cases was considerably above the seasonal expectancy. The total

number of cases was 5 times the 5-year median, while in the various sections the increase ranged from 2 times the median in the South Atlantic section to almost 12 times the median in the Pacific section. Since there were 3 rather low years of this disease preceding 1943 the 1939–43 median falls within one of those low years However, the 1934–38 median for the corresponding period was 212 cases and the 1929–33 median was 244 cases, both less than one-half of the current incidence

TABLE 1 —*Number of reported cases of 9 communicable diseases in the United States during the 4-week period Sept 10–Oct 7, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1 387	1 440	1 732	3 227	3 677	3 358	1 657	4 388	2 816
New England	17	25	25	16	18	9	173	417	[illegible]
Middle Atlantic	74	80	80	12	26	28	213	711	622
East North Central	119	143	143	79	111	222	281	1 465	519
West North Central	100	139	113	22	31	41	67	715	177
South Atlantic	310	485	697	968	1 013	936	124	296	151
East South Central	278	264	264	71	150	119	27	50	88
West South Central	287	178	290	1 828	1 950	1 369	127	124	124
Mountain	72	35	64	179	298	298	80	270	213
Pacific	130	91	85	52	77	101	565	340	359
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	519	696	107	4 451	3 032	2 239	4 803	6 232	5 165
New England	35	97	14	199	288	47	329	676	355
Middle Atlantic	112	169	29	2 030	304	304	[illegible]	905	816
East North Central	120	144	19	906	811	378	1 169	1 513	1 439
West North Central	43	42	9	313	430	270	528	752	534
South Atlantic	50	73	25	528	64	78	770	1 056	790
East South Central	28	44	11	195	27	41	385	377	456
West South Central	31	24	9	54	[illegible]	65	195	152	181
Mountain	17	19	5	59	274	71	[illegible]	251	172
Pacific	83	84	7	167	606	125	563	550	375
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	10	17	21	591	647	1 216	6 822	10 045	10 726
New England	0	0	0	34	39	31	523	886	886
Middle Atlantic	0	0	0	80	110	155	1 277	1 953	2 806
East North Central	7	8	8	62	85	142	[illegible]	2 898	3 009
West North Central	0	3	5	33	30	83	[illegible]	544	574
South Atlantic	2	1	1	118	133	273	1 108	1 348	1 160
East South Central	1	0	4	87	79	167	406	413	436
West South Central	0	4	4	114	90	234	655	594	509
Mountain	0	0	2	28	51	60	378	492	478
Pacific	0	1	2	35	30	49	[illegible]	917	917

[1] Mississippi and New York excluded, New York City included
[2] Mississippi excluded

Poliomyelitis.—The number of cases of poliomyelitis dropped from 5,971 during the preceding 4 weeks to 4,451 during the current period. Compared with preceding years the incidence was the highest since 1931, when 4,122 cases were reported for this period The number of cases was 1.5 times the 1943 figure and almost 2 times the 1939–43

median The incidence was higher than the 5-year median in all sections except the West South Central and Mountain. While the Mountain and Pacific regions have shown only the normal seasonal increase, the number of cases in California rose from 42 for the preceding 4-week period to 75 for the current period, and in Arizona from 4 cases for the preceding 4-week period to 15 for the current period.

TABLE 2 —*Number of cases of poliomyelitis reported in each geographic area during 1944, 1943, and 1941* [1]

Division	Total Jan 1 Oct 14	August		September					October			
		19	26	2	9	16	23	30	7	14	21	28
All regions												
1944	16 141	1 260	1 529	1 683	1 499	1 439	1 159	976	877	710		
1943	10 319	747	872	956	906	1,0[illegible]0	818	679	515	495	438	363
1941	7 586	611	624	586	595	596	592	456	429	312	294	285
New England												
1944	634	54	74	75	64	49	71	38	41	38		
1943	724	62	62	77	63	91	85	84	28	52	33	20
1941	342	21	40	27	48	37	33	33	25	18	18	9
Middle Atlantic												
1944	7 037	601	756	815	761	674	505	470	381	320		
1943	779	46	57	72	83	91	83	67	63	50	46	36
1941	1 853	173	163	169	213	210	210	160	146	97	88	101
East North Central												
1944	2 762	215	271	321	255	329	236	174	167	142		
1943	2 048	144	241	249	273	288	207	171	145	101	102	75
1941	1 109	82	102	71	93	96	117	72	84	46	46	47
West North Central												
1944	928	67	104	77	112	76	85	73	79	64		
1943	1 372	118	131	183	138	148	114	88	80	67	38	36
1941	379	17	32	38	28	37	32	19	29	22	22	10
South Atlantic												
1944	2 506	195	214	208	188	169	149	114	96	88		
1943	205	7	10	8	10	23	14	18	9	9	6	5
1941	1 745	139	133	115	80	79	81	74	61	57	38	41
East South Central												
1944	1 011	53	56	48	57	59	53	43	40	20		
1943	209	29	20	14	12	7	6	10	4	6	3	9
1941	1 522	147	121	132	86	93	83	62	50	47	50	52
West South Central												
1944	422	16	11	14	17	14	13	14	13	7		
1943	1 782	104	117	81	90	89	67	49	23	38	28	27
1941	227	11	13	8	12	9	12	12	12	9	16	10
Mountain												
1944	181	12	16	12	15	18	21	12	8	5		
1943	774	43	47	123	93	92	85	46	51	36	38	33
1941	107	2	9	11	13	8	5	4	3	3	4	7
Pacific												
1944	640	47	27	33	30	51	26	38	52	26		
1943	2 428	194	187	149	144	191	157	146	112	136	144	122
1941	302	19	11	15	22	27	19	20	19	10	16	8

[1] Similar tables with earlier data appeared in Public Health Reports for August 4, 1944, page 1024, and September 1, 1944, page 1143

Table 2 shows the number of reported cases during current weeks of 1944 with data for corresponding weeks of 1943 and 1941 In the 41 weeks since the beginning of 1944 there have been 16,141 cases of poliomyelitis reported as compared with 10,319 and 7,586 in the corresponding weeks of 1943 and 1941, respectively In 1942 the number of cases reported for the corresponding period was 2,614 While the cases have fluctuated considerably during the current 4 weeks, it is apparent that the disease reached its peak in practically all sections of the country during either August or September, the highest incidence

of this disease normally occurs during those months. During the week ended October 14 (the latest data available) there was a further decline in the number of cases in all sections of the country.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The number of cases (1,387) of diphtheria reported for the 4 weeks ended October 7 was slightly below the number reported for the corresponding period in 1943 and about 80 percent of the 1939–43 median incidence. In the Atlantic Coast, North Central, and West South Central sections the incidence was below the seasonal expectancy, but the East South Central, Mountain, and Pacific regions all reported excesses over the preceding 5-year median; the largest excess was reported from the Pacific region.

Influenza.—The number of cases of influenza rose from approximately 2,200 during the 4 weeks ended September 9 to 3,227 during the current 4-week period. The incidence was, however, about 10 percent below that reported during the corresponding period in 1943, and was slightly below the 1939–43 median. A slight increase over the normal seasonal incidence was reported from the South Atlantic section and in the West South Central section the number of cases (1,828) was 1.3 times the median, but in other sections the incidence was relatively low.

Measles.—For the 4 weeks ended October 7 there were 1,657 cases of measles reported, as compared with 4,388 in 1943 and a preceding 5-year median of 2,816 cases. In the Pacific section the number of cases was about 45 percent above the normal seasonal expectancy and in the West South Central section the incidence was about normal, but all other sections reported a relatively low number of cases.

Scarlet fever.— The number of cases of scarlet fever rose from 2,746 during the preceding 4 weeks to 4,803 during the current 4-week period. An increase of this disease is normally expected at this season of the year, but the rate of increase during the current period was considerably below that of the corresponding period in preceding years. For the country as a whole the number of cases was less than 80 percent of the number reported in 1943 and about 90 percent of the preceding 5-year median. Of the nine geographic sections, six reported less than the seasonal expectancy and three sections reported an excess over the 1939–43 median; the largest excess was reported from the Pacific section.

Smallpox.—Ten cases of smallpox were reported for the 4 weeks ended October 7, as compared with 17 cases in 1943 and a 5-year median of 21 cases. Of the 10 cases, Ohio reported 3, Indiana 4, and Virginia, West Virginia, and Tennessee 1 each. The current incidence and that during the preceding 4-week period, which was

also 10 cases, has been the lowest incidence on record for any 4-week period.

Typhoid and paratyphoid fever.—This disease was relatively low, 591 cases being reported for the current 4-week period, as compared with 647 for the corresponding period in 1943 and a 5-year median of 1,216 cases. The situation was favorable in all sections of the country. For the country as a whole the incidence was the lowest on record for this period.

Whooping cough.—Whooping cough incidence was below normal, the 6,822 cases reported during the current 4 weeks representing a decline from the 1939–43 median of approximately 20 percent. The West South Central section reported a slight increase over the 5-year median, but in all other sections the incidence was below the seasonal expectancy.

MORTALITY, ALL CAUSES

For the 4 weeks ended October 7 there were 32,138 deaths from all causes reported to the Bureau of the Census by 93 large cities. The average number of deaths reported for the corresponding period in 1941–43 was 32,155.

DEATHS DURING WEEK ENDED OCTOBER 7, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 7, 1944	Corresponding week, 1943
Data for 92 large cities of the United States:		
Total deaths	8,272	8,347
Average for 3 prior years	8,356	
Total deaths, first 40 weeks of year	358,525	366,068
Deaths under 1 year of age	648	614
Average for 3 prior years	606	
Deaths under 1 year of age, first 40 weeks of year	24,629	26,466
Data from industrial insurance companies:		
Policies in force	66,756,380	65,900,899
Number of death claims	11,581	10,543
Death claims per 1,000 policies in force, annual rate	9.1	8.3
Death claims per 1,000 policies, first 40 weeks of year, annual rate	10.1	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 14, 1944

Summary

Continuing the downward trend for the sixth week, a total of 710 cases of poliomyelitis was reported, representing a decline of 19 percent from last week's total of 877 cases, which was, in turn, 10 percent below that for the next earlier week. The 5-year (1939–43) median for the week is 429, and the total for the corresponding week last year was 484. Decreases occurred in all of the 9 geographic divisions of the country, but increases occurred in 6 of the 15 States reporting more than 12 cases each. These apparent increases may be due to delayed reports, which do not show date of onset. The changes were as follows (last week's figures in parentheses): *Increases*—Massachusetts 27 (20), Pennsylvania 60 (54), Illinois 36 (33), Missouri 17 (10), District of Columbia 13 (5), West Virginia 14 (13); *decreases*—New York 234 (294), New Jersey 26 (33), Ohio 60 (73), Michigan 22 (23), Wisconsin 13 (26), Minnesota 25 (40), Iowa 14 (15), Maryland 16 (22), Virginia 21 (30).

The total for the year to date is 16,133, as compared with a 5-year median of 7,279 and 10,319 for the corresponding period last year—the latter figure being 83 percent of the year's total of 12,439.

A total of 155 cases of meningococcus meningitis was reported, as compared with 142 last week, a 5-year median of 34, and 240 for the corresponding week last year. States reporting more than 10 cases each are as follows (last week's figures in parentheses): New York 19 (12), Pennsylvania 12 (5), Michigan 12 (9), California 13 (16). The cumulative total to date is 14,153, as compared with 14,954 for the same period last year and a 5-year median of 1,645. Since the week ended March 4 the weekly totals have been continuously below the corresponding weekly figures for last year.

Although slight seasonal increases are recorded in the incidence of diphtheria, influenza, measles, and scarlet fever, the current reports of all of these diseases except influenza are below the corresponding 5-year medians. Due to the high incidence early in the year, the cumulative figures for influenza, measles, and scarlet fever are above the respective 5-year medians.

Deaths recorded for the week in 93 large cities of the United States totaled 8,412, as compared with 8,290 for the preceding week and a 3-year (1941–43) average of 8,272. The total to date is 368,221, as compared with 376.037 for the corresponding period last year.

also 10 cases, has been the lowest incidence on record for any 4-week period.

Typhoid and paratyphoid fever.—This disease was relatively low, 591 cases being reported for the current 4-week period, as compared with 647 for the corresponding period in 1943 and a 5-year median of 1,216 cases. The situation was favorable in all sections of the country. For the country as a whole the incidence was the lowest on record for this period.

Whooping cough.—Whooping cough incidence was below normal, the 6,822 cases reported during the current 4 weeks representing a decline from the 1939–43 median of approximately 20 percent. The West South Central section reported a slight increase over the 5-year median, but in all other sections the incidence was below the seasonal expectancy.

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For the 4 weeks ended October 7 there were 32,138 deaths from all causes reported to the Bureau of the Census by 93 large cities. The average number of deaths reported for the corresponding period in 1941–43 was 32,155.

DEATHS DURING WEEK ENDED OCTOBER 7, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 7, 1944	Corresponding week, 1943
Data for 92 large cities of the United States:		
Total deaths	8 272	8 347
Average for 3 prior years	8 35[illegible]	
Total deaths, first 40 weeks of year	358 5[illegible]	366 008
Deaths under 1 year of age	648	614
Average for 3 prior years	[illegible]	
Deaths under 1 year of age, first 40 weeks of year	24 [illegible]23	26 466
Data from industrial insurance companies:		
Policies in force	6[illegible] 756 380	65 900 899
Number of death claims	11 581	10 543
Death claims per 1,000 policies in force, annual rate	9 1	8 3
Death claims per 1,000 policies, first 40 weeks of year, annual rate	10 1	9 7

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Telegraphic morbidity reports from State health officers for the week ended October 14, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Oct. 14, 1944	Oct. 16, 1943		Oct. 14, 1944	Oct. 16, 1943		Oct. 14, 1944	Oct. 16, 1943		Oct. 14, 1944	Oct. 16, 1943	
NEW ENGLAND												
Maine	0	1	1	------	------	------	1	60	24	2	2	0
New Hampshire	0	0	0	------	------	------	0	4	4	0	1	0
Vermont	0	0	0	7	------	------	1	15	6	0	0	0
Massachusetts	4	5	3	------	------	------	40	74	74	5	15	2
Rhode Island	0	0	0	9	------	------	0	18	5	3	3	0
Connecticut	1	1	1	7	2	2	6	9	9	2	2	1
MIDDLE ATLANTIC												
New York	11	7	16	[1] 2	[1] 5	[1] 5	25	108	76	19	28	3
New Jersey	1	4	4	1	5	11	13	80	24	9	9	1
Pennsylvania	8	15	15	2	1	------	29	59	67	12	20	5
EAST NORTH CENTRAL												
Ohio	9	12	15	2	------	9	8	107	21	9	20	1
Indiana	5	9	9	3	5	5	5	49	11	1	4	1
Illinois	8	14	20	------	9	7	19	39	19	10	20	1
Michigan [2]	14	20	12	------	1	1	7	246	57	12	19	2
Wisconsin	0	3	3	9	17	25	43	195	53	2	4	1
WEST NORTH CENTRAL												
Minnesota	19	8	4	2	------	2	2	183	7	5	0	0
Iowa	1	4	3	------	------	------	2	8	8	4	1	0
Missouri	4	8	7	------	3	1	1	5	5	7	7	0
North Dakota	3	0	1	------	4	4	0	259	4	2	0	0
South Dakota	4	2	2	------	------	------	1	4	4	0	0	0
Nebraska	13	11	1	4	2	2	2	8	8	0	1	0
Kansas	2	1	2	------	2	3	13	5	6	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	1	------	------	------	0	1	1	0	2	0
Maryland [2]	6	3	7	4	2	3	2	7	6	2	9	0
District of Columbia	0	0	2	------	------	------	0	1	1	1	1	0
Virginia	10	11	31	123	129	114	2	37	22	4	7	1
West Virginia	7	20	11	2	------	2	0	10	5	4	5	0
North Carolina	30	31	71	5	1	------	7	15	15	2	5	0
South Carolina	13	25	37	218	133	200	2	4	4	1	2	0
Georgia	22	25	39	12	13	14	5	13	7	2	3	1
Florida	6	8	8	1	11	1	4	6	1	2	3	1
EAST SOUTH CENTRAL												
Kentucky	6	13	16	------	------	2	2	19	12	0	5	2
Tennessee	13	10	23	4	11	8	0	6	11	3	7	1
Alabama	37	32	30	17	38	23	2	11	5	1	1	1
Mississippi [2]	27	17	17	------	------	------	------	------	------	1	3	0
WEST SOUTH CENTRAL												
Arkansas	10	6	16	32	17	16	1	6	5	0	0	0
Louisiana	25	7	14	1	4	3	1	1	1	1	1	1
Oklahoma	12	4	10	22	23	38	0	3	3	1	0	0
Texas	46	33	34	647	723	361	44	25	25	4	6	2
MOUNTAIN												
Montana	0	3	3	2	5	3	2	52	17	1	0	0
Idaho	0	0	0	3	------	1	1	0	3	0	0	0
Wyoming	1	0	0	2	3	1	1	6	6	0	1	0
Colorado	3	2	8	10	21	21	12	39	9	1	0	0
New Mexico	11	0	0	------	------	------	0	0	1	0	0	0
Arizona	2	10	1	20	63	47	0	13	13	0	1	0
Utah [2]	0	0	0	------	------	1	5	3	7	0	0	0
Nevada	0	0	0	------	2	------	1	0	0	0	0	0
PACIFIC												
Washington	8	3	0	------	------	------	8	9	9	4	2	0
Oregon	2	1	1	7	6	7	21	11	11	3	3	1
California	26	26	16	11	29	28	180	43	43	13	17	1
Total	430	415	517	1,191	1,290	995	521	1,876	980	156	240	34
41 weeks	9,245	9,865	10,697	344,741	88,361	155,313	594,891	546,291	471,849	14,154	14,954	1,645

[1] New York City only. [2] Period ended earlier than Saturday.

*Telegraphic morbidity reports from State health officers for the week ended October 14, 1944, and comparison with corresponding week of 1943 and 5-year median—*Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended		Median 1939–43
	Oct 14, 1944	Oct 16, 1943		Oct 14, 1944	Oct 16, 1943		Oct 14, 1944	Oct 16, 1943		Oct 14, 1944	Oct 16, 1943	
NEW ENGLAND												
Maine	0	0	1	14	16	6	0	0	0	1	2	2
New Hampshire	2	1	1	1	1	2	0	0	0	0	0	0
Vermont	2	4	1	4	6	7	0	0	0	0	1	0
Massachusetts	27	19	4	87	141	92	0	0	0	3	3	3
Rhode Island	1	12	1	7	4	3	0	0	0	0	0	0
Connecticut	7	16	4	24	24	18	0	0	0	7	0	0
MIDDLE ATLANTIC												
New York	234	35	35	126	183	124	0	0	0	5	11	14
New Jersey	26	6	9	25	35	39	0	0	0	4	0	3
Pennsylvania	60	9	13	113	110	110	0	0	0	8	5	13
EAST NORTH CENTRAL												
Ohio	60	7	7	120	189	137	1	0	0	3	5	7
Indiana	11	1	5	32	57	50	0	0	1	7	5	4
Illinois	36	57	25	70	129	129	0	3	0	1	2	17
Michigan [2]	22	24	31	77	75	75	0	1	0	2	3	4
Wisconsin	13	12	9	34	110	89	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	25	7	19	37	68	57	0	0	0	0	1	0
Iowa	14	18	12	29	72	45	0	0	0	1	1	2
Missouri	17	4	2	14	35	35	0	0	0	0	3	7
North Dakota	2	1	1	8	6	11	0	0	0	0	0	0
South Dakota	2	0	1	6	13	13	0	0	0	1	0	0
Nebraska	1	0	6	33	24	16	0	2	0	0	0	1
Kansas	3	31	11	57	62	62	0	0	0	0	1	2
SOUTH ATLANTIC												
Delaware	6	0	0	0	4	7	0	0	0	0	0	0
Maryland [2]	16	2	2	43	24	26	0	0	0	1	5	5
District of Columbia	13	0	0	4	17	11	0	0	0	0	0	1
Virginia	21	5	5	42	34	38		0	0	3	9	9
West Virginia	14	0	2	51	84	42	0	0	0	2	9	5
North Carolina	10	1	2	62	138	113	0	0	0	5	6	6
South Carolina	0	0	2	4	15	15	0	0	0	0	2	3
Georgia	5	1	1	8	40	42	0	0	0	12	3	8
Florida	3	0	0	8	9	6	0	0	0	4	1	1
EAST SOUTH CENTRAL												
Kentucky	12	4	6	34	63	62	0	0	0	3	5	14
Tennessee	7	0	3	51	57	53	0	1	0	2	4	12
Alabama	0	1	3	16	21	32	0	0	0	1	1	3
Mississippi [2]	1	1	1	10	19	17	0	1	0	2	1	2
WEST SOUTH CENTRAL												
Arkansas	3	0	1	5	7	13	0	0	1	3	0	7
Louisiana	0	1	3	7	10	10	0	0	0	4	3	8
Oklahoma	0	11	2	13	17	17	0	0	0	0	11	5
Texas	4	21	8	35	32	32	0	0	0	5	9	16
MOUNTAIN												
Montana	0	0	0	10	19	12	0	1	0	1	0	0
Idaho	1	0	0	12	17	12	0	0	0	0	0	0
Wyoming	0	3	1	10	3	4	1	0	0	0	1	1
Colorado	3	15	1	20	25	18	1	0	0	1	1	1
New Mexico	1	0	0	3	5	5	0	0	0	1	1	3
Arizona	0	0	1	2	7	4	0	0	0	1	2	1
Utah [2]	0	10	3	8	10	10	0	0	0	0	0	0
Nevada	0	2	0	0	2	0	0	0	0	0	0	0
PACIFIC												
Washington	8	28	6	38	53	28	0	0	0	0	1	2
Oregon	8	32	5	28	31	7	0	0	0	1	1	1
California	10	76	14	114	133	87	0	0	0	7	3	6
Total	711	484	429	1 565	2 256	1 981	3	9	10	102	122	236
41 weeks	16 134	10 319	7 279	156 063	108 609	108 609	324	644	1 221	4 577	4 618	7 014

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts 3 New York 1 Ohio 1, Georgia, 8, Texas, 1, California, 1

Telegraphic morbidity reports from State health officers for the week ended October 14, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Whooping cough: Week ended—Oct 14 1944	Whooping cough: Week ended—Oct 16 1943	Whooping cough: Median 1939-43	Week ended October 14, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	16	18	8	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	10	8	12	0	0	0	0	0	0	0	0	0
Massachusetts	45	61	99	0	0	11	0	0	0	0	0	0
Rhode Island	15	41	19	0	0	0	0	0	0	0	0	0
Connecticut	12	22	65	0	0	3	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	136	207	281	1	4	35	0	0	0	0	0	0
New Jersey	44	92	89	0	0	1	0	1	0	0	0	0
Pennsylvania	108	171	239	1	0	0	0	1	0	0	0	0
EAST NORTH CENTRAL												
Ohio	90	159	176	0	0	0	0	0	0	0	0	0
Indiana	13	12	12	0	0	0	0	0	0	0	0	0
Illinois	47	150	173	0	2	1	0	0	0	0	2	0
Michigan [2]	69	167	210	0	2	8	0	0	0	0	0	0
Wisconsin	66	151	139	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	29	48	48	0	5	0	0	0	0	0	0	0
Iowa	1	40	12	0	0	0	0	0	0	0	0	0
Missouri	12	20	16	0	0	0	1	0	0	0	0	0
North Dakota	6	35	13	0	0	0	7	1	0	0	0	0
South Dakota	6	12	5	0	0	0	0	1	0	0	0	0
Nebraska	0	16	5	0	0	0	0	0	0	0	0	0
Kansas	22	36	29	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	3	0	0	0	0	0	0	0	0	0
Maryland [2]	73	49	49	0	0	0	1	1	0	0	0	0
District of Columbia	4	9	9	0	0	0	0	0	0	0	0	0
Virginia	14	59	20	0	0	0	191	0	0	0	1	1
West Virginia	7	11	17	0	0	0	0	0	0	1	0	0
North Carolina	80	150	65	0	1	3	0	0	0	0	0	3
South Carolina	37	25	19	0	0	5	0	0	0	0	0	4
Georgia	100	17	10	0	1	6	0	0	0	0	0	35
Florida	4	23	5	0	0	0	1	0	0	0	0	14
EAST SOUTH CENTRAL												
Kentucky	6	54	45	0	0	0	0	0	0	1	0	0
Tennessee	12	52	34	0	0	0	4	1	0	0	0	2
Alabama	8	6	12	0	0	0	0	0	0	0	0	25
Mississippi [2]				0	0	0	0	0	0	0	1	5
WEST SOUTH CENTRAL												
Arkansas	37	9	18	0	5	10	0	0	0	0	0	1
Louisiana	0	1	2	0	0	0	0	0	1	0	1	2
Oklahoma	13	1	3	0	0	0	0	0	0	0	0	0
Texas	99	96	90	0	37	499	9	5	0	0	0	44
MOUNTAIN												
Montana	17	18	8	0	0	0	0	0	0	0	1	0
Idaho	0	0	1	0	0	0	0	0	0	0	0	0
Wyoming	2	8	4	0	0	0	0	0	0	0	0	0
Colorado	9	37	19	0	0	1	0	0	0	0	2	0
New Mexico	3	21	20	0	0	1	0	0	0	0	0	0
Arizona	3	8	7	0	0	0	15	0	0	0	0	0
Utah [2]	5	22	22	0	0	0	0	0	0	0	1	0
Nevada	2	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	17	67	15	0	0	1	0	0	0	0	0	0
Oregon	7	26	16	0	0	0	0	0	0	0	0	0
California	67	122	175	0	4	14	0	6	0	0	0	1
Total	1,373	2,357	2,600	2	61	599	229	18	1	2	9	137
Same week 1943	2,357			1	32	269	107	6	1	1	11	150
Same week 1942	2,614			1	47	526	124	12	0	2	7	104
41 weeks 1944	76,482			37	1,429	18,291	7,267	543	24	439	459	4,044
41 weeks 1943	152,322			51	1,707	13,406	6,467	569	22	419	677	3,349
41 weeks 1942	144,350		[4] 145,873	68	968	10,351	5,729	457	38	[4] 440	737	[4] 2,248

[2] Period ended earlier than Saturday

[4] 5 year median 1939-43

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct 7, 1944

This table lists the reports from 87 cities of more than 10 000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	4	0	0	3	0	0	0
New Hampshire												
Concord	0	0		0	0	0	1	0	0	0	0	0
Massachusetts												
Boston	0	0		0	22	0	10	11	26	0	0	17
Fall River	0	0		0	0	0	0	0	2	0	0	1
Springfield	0	0		0	0	1	1	0	0	0	0	0
Rhode Island												
Providence	0	0	1	1	0	0	2	0	1	0	0	14
Connecticut												
Bridgeport	0	0		0	0	0	0	0	1	0	0	0
Hartford	0	0		0	0	1	0	0	1	0	0	3
New Haven	0	0		0	0	0	0	0	2	0	0	11
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		1	0	0	1	17	2	0	0	0
New York	11	3	1	0	1	6	44	104	46	0	5	84
Rochester	0	0		0	4	0	1	24	1	0	0	3
Syracuse	0	0		0	0	0	2	0	2	0	0	10
New Jersey												
Camden	0	0		0	0	2	0	1	2	0	0	0
Newark	0	0	1	0	1	1	[illegible]	0	2	0	0	10
Trenton	0	0	1	0	0	0	[illegible]	1	1	0	0	0
Pennsylvania												
Philadelphia	3	0	1	0	1	2	9	9	17	0	5	25
Pittsburgh	0	0	1	1	1	1	10	3	12	0	1	4
Reading	0	0		0	0	0	0	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	3	0		0	0	3	5	13	10	0	0	10
Cleveland	0	0		0	2	4	9	10	14	0	0	20
Columbus	0	0		0	0	0	1	1	5	0	0	9
Indiana												
Fort Wayne	0	0		0	0	0	2	1	0	0	2	0
Indianapolis	3	0		0	0	1	3	1	3	0	0	0
South Bend	0	0		0	0	0	0	0	1	0	0	0
Terre Haute	0	0		0	0	0	1	0	1	0	0	0
Illinois												
Chicago	2	0	2	1	9	4	17	5	26	0	0	13
Michigan												
Detroit	7	0		0	2	5	6	19	16	0	0	17
Flint	1	0		0	0	0	3	1	3	0	0	0
Grand Rapids	0	0		0	0	0	0	0	6	0	1	3
Wisconsin												
Kenosha	0	0		0	0	0	0	1	0	0	0	9
Milwaukee	0	0		0	0	2	1	0	8	0	0	14
Racine	0	0		0	0	0	0	0	4	0	0	2
Superior	0	0		0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	1	0	0	0	2	0	0	3
Minneapolis	6	0		0	1	1	3	13	7	0	0	6
St Paul	0	0		0	0	0	1	5	6	0	0	5
Missouri												
Kansas City	0	0		0	0	2	9	0	6	0	0	0
St Joseph	0	0		0	0	0	0	0	0	0	0	0
St Louis	0	0	2	0	0	2	9	4	5	0	0	4
North Dakota												
Fargo	0	0	--	0	0	0	1	3	1	0	0	0

City reports for week ended Oct 7, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska												
Omaha	0	0		0	1	1	5	1	5	0	0	0
Kansas												
Topeka	0	0		0	1	0	0	0	1	0	0	1
Wichita	0	0		0	0	0	1	0	1	0	0	1
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	0	0	0	0	0	0	0	0
Maryland												
Baltimore	9	0		0	0	4	6	8	8	0	0	63
Cumberland	0	0		0	0	0	1	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0	2	0	1	0	1	5	5	0	0	1
Virginia												
Lynchburg	0	0		0	0	0	0	2	3	0	0	0
Richmond	0	0		0	0	1	1	1	1	0	0	1
Roanoke	0	0		0	0	0	2	2	0	0	0	0
West Virginia												
Charleston	0	0		0	0	0	0	0	4	0	0	0
Wheeling	0	0		0	0	0	1	0	2	0	0	0
North Carolina												
Raleigh	0	0		0	1	0	2	1	0	0	0	3
Wilmington	1	0		0	0	0	3	0	2	0	0	1
Winston Salem	0	0		0	1	0	0	0	4	0	0	1
South Carolina												
Charleston	0	0		0	0	0	1	0	1	0	1	0
Georgia												
Atlanta	0	0	6	0	0	0	2	1	0	0	0	0
Brunswick	0	0		0	1	0	0	0	1	0	0	0
Savannah	0	0	1	1	0	0	0	0	1	0	0	0
Florida												
Tampa	0	0		0	0	0	3	0	0	0	2	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	2	0		0	4	0	3	1	1	0	1	2
Nashville	0	0		1	0	1	1	0	3	0	0	0
Alabama												
Birmingham	1	0		0	0	0	1	0	3	0	0	0
Mobile	2	0		2	0	0	1	0	2	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	1	0	3	0	0	0	3	0	1	0	0	0
Louisiana												
New Orleans	4	0	1		0	1	6	0	1	0	2	0
Shreveport	1	0		0	0	0	0	0	0	0	2	0
Texas												
Dallas	6	0		0	1	0	2	0	0	0	0	0
Galveston	1	0		0	0	0	1	0	0	0	0	0
Houston	0	0	1	0	0	0	5	4	1	0	1	14
San Antonio	0	0	2	1	1	0	3	2	2	0	0	0
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	0	0	0	1
Great Falls	0	0		0	0	0	1	0	1	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	2
Missoula	0	0		0	0	0	1	0	0	0	0	0
Idaho												
Boise	0	0		0	0	1	0	0	0	0	0	0
Colorado												
Denver	5	0		0	1	1	4	3	3	0	0	4
Pueblo	0	0		0	1	0	0	0	2	0	0	0
Utah												
Salt Lake City	0	0		1	1	0	0	0	4	0	0	0

City reports for week ended Oct 7, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington												
Seattle	1	0		0	3	0	2	2	0	0	0	1
Spokane	0	0		0	2	1	1	1	3	0	0	0
Tacoma	0	0	-	0	1	0	0	0	1	0	0	0
California												
Los Angeles	4	0	2	0	3	1	5	4	18	0	0	1
Sacramento	0	1	1	0	2	0	0	0	1	0	0	16
San Francisco	1	0	1	0	13	1	2	0	12	0	0	2
Total	75	4	35	10	85	55	239	285	344	0	23	412
Corresponding week, 1943	48		34	14	316		281	-	148	0	18	653
Average, 1939-43	74		50	[1] 12	[2] 205		[1] 265		409	1	33	938

[1] 3-year average, 1941-43
[2] 5-year median, 1939-43

Dysentery, amebic—Cases Boston, 1 New Haven, 1, Chicago, 3, Charleston S C, 1
Dysentery, bacillary—Cases Fall River, 6 Buffalo, 2, New York, 7, Rochester, 2, Syracuse, 1, Detroit, 1, Charleston, S C, 4 Atlanta, 1 Los Angeles, 5
Dysentery, unspecified,—Cases Richmond, 1
Rocky Mountain spotted fever—Cases Pittsburgh 1
Tularemia—Cases Shreveport 1
Typhus fever, endemic—Cases Charleston S C, 8 Tampa, 1, Nashville, 2, Mobile, 8 Little Rock, 1, New Orleans, 9, Dallas, 1, Houston, 5, San Antonio, 8

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,132,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	2.9	2.9	64	17.3	40.4	31.8	104	0.0	0.0	133
Middle Atlantic	6.5	1.4	2.3	0.9	4	5.6	37.0	73.6	40	0.0	5.1	63
East North Central	9.8	0.0	1.2	0.6	9	11.7	29.4	31.9	59	0.0	1.8	59
West North Central	11.9	0.0	4.0	0.0	8	11.9	57.7	51.7	68	0.0	0.0	40
South Atlantic	16.3	0.0	22.9	1.6	7	8.2	37.6	32.7	52	0.0	4.9	114
East South Central	29.5	0.0		17.7	24	5.9	35.4	5.9	53	0.0	5.9	12
West South Central	37.3	0.0	20.1	2.9	6	2.9	63.1	17.2	14	0.0	14.3	40
Mountain	39.7	0.0		7.9	24	15.9	55.6	23.8	79	0.0	0.0	56
Pacific	9.5	1.6	6.3	0.0	38	4.7	15.8	11.1	55	0.0	0.0	32
Total	11.5	0.6	5.4	1.5	13	8.4	36.6	43.7	53	0.0	3.5	63

PLAGUE INFECTION IN KERN COUNTY, CALIF.

Plague infection has been reported proved in a pool of 200 fleas from 31 ground squirrels, *C. beecheyi*, collected September 22 on a ranch 7 miles north of California Institution for Women, Bear Valley, Kern County, Calif.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—August 1944.—During the month of August 1944, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	12				6		1		19	
Diphtheria	9	0			1		5		15	1
Dysentery:										
Amebic			1				8	1	9	1
Bacillary	2				1		3		6	
Leprosy							1		1	
Malaria [1]	15		5		106		88	5	214	5
Measles	1				3				4	
Mumps	2		1		11		1		15	
Paratyphoid fever	3				2		4		9	
Pneumonia		7		3	23	1		4	[2] 23	15
Poliomyelitis					1		2	1	3	1
Scarlet fever							1		1	
Tuberculosis		23		3	3	1		10	[2] 3	37
Typhoid fever			1				3		4	

[1] 36 recurrent cases. [2] In the Canal Zone only.

Puerto Rico

Notifiable diseases—4 weeks ended October 7, 1944.—During the 4 weeks ended October 7, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	20	Ophthalmia neonatorum	2
Diphtheria	35	Puerperal fever	1
Dysentery	14	Ringworm	1
Filariasis	32	Syphilis	535
German measles	67	Tetanus	5
Gonorrhea	396	Tetanus, infantile	1
Influenza	125	Tuberculosis (all forms)	720
Leprosy	2	Typhoid fever	32
Lymphogranuloma inguinale	1	Typhus fever (endemic)	7
Malaria	893	Whooping cough	345
Measles	703		

Virgin Islands of the United States

Notifiable diseases—July–September 1944.—During the months of July, August, and September 1944, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	July	August	September	Disease	July	August	September
Cerebrospinal meningitis		1		Pellagra			1
Chickenpox	1		2	Schistosomiasis		2	
Dysentery, amebic		1		Syphilis	18	40	20
Filariasis	10	8	8	Trachoma		2	
Gonorrhea	9	11	8	Tuberculosis	3	1	1
Hookworm disease	3	7	4	Typhoid fever			2
Mumps		1		Typhus fever	4	13	

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 23, 1944.—During the week ended September 23, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		24	1	20	43	7	3	5	21	124
Diphtheria	2	1	3	21	4	1	2			34
Dysentery, bacillary				2	3				16	21
Encephalitis, infectious							1	1	1	3
German measles				4	8	1		3	8	24
Influenza					11				5	16
Measles				18	7	7	5	10	6	53
Meningitis, meningococcus				4	6					10
Mumps		3		11	39	1		18	13	85
Poliomyelitis			3	4	21	7		4		39
Scarlet fever		11	10	3	70	13	4	5	18	134
Tuberculosis (all forms)		1		132	44	14	19		35	245
Typhoid and paratyphoid fever			1	28	4			3	2	38
Undulant fever					3	1			3	7
Whooping cough		16		156	53	10	26	12	29	302

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER [a]

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–July 1944	August 1944	September 1944—week ended—				
				2	9	16	23	30
ASIA								
Ceylon	C	2						
India	C	126,005	29,182					
Calcutta	C	2,863	224	31	35			
Chittagong	C	63						
Madras	C	36			1			
Negapatam	C	17						
Vizagapatam	C	23	246					

[a] It was found necessary to omit this table in the preceding issue of the Public Health Reports. It is published monthly and in the future it will again appear in the last issue of each month.

PLAGUE

[C indicates cases, D, deaths, P, present]

Place		January—July 1944	August 1944	September 1944—week ended—				
				2	9	16	23	30
AFRICA								
Algeria	C	2						[1] 29
Belgian Congo	C	4		1		2		5
Plague-infected rats		P						
British East Africa								
Kenya	C	6						
Uganda	C	5						
Egypt	C	626	13		2			
Port Said	C	58	13		2			
Suez	C	157						
French West Africa Dakar	C	145	163	38	38	35		
Madagascar	C	69	11					
Morocco (French)	C	77	62					
Rhodesia, northern	C	1						
Senegal	C	17	2					
Tunisia	C		1	P				
Union of South Africa	C	23						13
ASIA								
China								
Chekiang Province	C						P	
Foochow	C	P						
Kiangsi Province	C		P				[2] 104	
India	C	6,862	357					
Indochina	C	57						
Palestine	C	4	16	3	4	3	9	
EUROPE								
Portugal Azores	C	13	1	1	2	1	1	1
SOUTH AMERICA								
Bolivia								
Chuquisaca Department	C	5						
Santa Cruz Department	C		5					
Tarija Department	C	9	3					
Brazil	C	94						
Ecuador								
Chimborazo Province	C	4						
Loja Province	C	1	3					
Peru								
Ancash Department	C	57						
Lambayeque Department	C	1						
Libertad Department	C	5						
Lima Department	C	17						
Piura Department	C	2						
OCEANIA								
Hawaii Territory								
Hamakua District	D	[3] 5						
Plague-infected rats [4]		[5] 45	[6] 4					

[1] For the month of September 1944

[2] From the beginning of the outbreak in August 1944

[3] Includes 1 death from pneumonic plague

[4] 53 fleas were also proved positive for plague on March 7, 1944

[5] Includes 12 plague infected mice

[6] Also plague infected tissue in a pool of 8 mice.

SMALLPOX

[C indicates cases, D, deaths, P, present]

Place		January–July 1944	August 1944	September 1944—week ended— 2	9	16	23	30
AFRICA								
Algeria	C	720	18					
Angola	C	29						
Basutoland	C	141						
Belgian Congo	C	1 277	108	98	56	28		
British East Africa								
Kenya	C	2 877	87	19	14			
Mombasa	C	143						
Tanganyika	C	2 426	198					
Uganda	C	2 947	392	136	111	62		
Cameroon (French)	C	365						
Dahomey	C	66	19					
Egypt	C	10 722						
French Equatorial Africa	C	1 239	38					
French Guinea	C	862	18					
French West Africa	C	109	11					
Gambia	C	13						
Gold Coast	C	6						
Ivory Coast	C	403	11					
Mauritania	C	1	1					
Morocco (French)	C	648						
Mozambique	C	3						
Nigeria	C	3 311	208					
Niger Territory	C	550	4					
Senegal	C	162	22					
Sierra Leone	C	393						
Sudan (Anglo Egyptian)	D	1						
Sudan (French)	C	1 883	11					
Tunisia	C	6						
Union of South Africa	C	276	76		36	19		
ASIA								
Arabia	C	[1] 9						
Ceylon	C	8						
China Kunming (Yunnan Fu)	C	53						
India	C	216 018	6 925					
Indochina	C	1,557						
Iran	C	789						
Iraq	C	31			6			
Palestine	C	153	6			1	1	
Syria and Lebanon	C	176	3					
EUROPE								
France	C	1						
Gibraltar	C	P						
Great Britain	C	[2] 18						
Greece	C	321						
Italy	C	515	123	10	4	16	19	3[illegible]
Portugal	C	30	1		1			
Spain	C	163	3					
Turkey	C	5,628						
NORTH AMERICA								
Dominican Republic	C	1						
Guatemala	C	7	1					
Honduras	C	9						
Mexico	C	2,021	277					
SOUTH AMERICA								
Bolivia	C	574	180					
Brazil	C	312	273	36	42			
Colombia	C	314	27	6	3	4	2	4
Ecuador	C	10	9					
Peru	C	218						
Lima	C	19						
Venezuela	C	235	79					

[1] Includes 4 imported cases

[2] Includes 1 case imported from the Middle East

TYPHUS FEVER

[C indicates cases]

Place		January–July 1944	August 1944	September 1944—week ended— 2	9	16	23	30
AFRICA								
Algeria	C	940	33					
Basutoland	C	95						
Belgian Congo	C	10	3	4	8	1		
British East Africa: Kenya	C	7						
Egypt	C	16,504	223					
French Guinea	C	2						
French West Africa: Dakar	C	28	8					
Gold Coast	C	5						
Morocco (French)	C	2,330						
Morocco (Spanish)	C	7	1					
Mozambique	C	2						
Nigeria	C	2						
Rhodesia, northern	C	62	13					
Sierra Leone	C	30						
Sudan (Anglo-Egyptian)	C	2			1			
Tunisia	C	612	24					
Union of South Africa	C	4,458						
ASIA								
Arabia: Western Aden Protectorate	C	[1] 15						
Ceylon	C	1						
China: Kunming (Yunnan Fu)	C	64	13	8	3	3	1	
India	C	6						
Indochina	C	1,004						
Iran	C	6,407						
Iraq	C	564	14					
Palestine	C	410	14	1	8	2	9	
Syria and Lebanon	C	427	1					
Trans-Jordan	C	37						
EUROPE								
Belgium	C	10						
Bulgaria	C	686						
France	C	11						
Germany	C	215						
Greece	C	294						
Hungary	C	3,113	112	33	21	11		
Irish Free State	C	7						
Italy	C	1	6					
Netherlands	C	8						
Norway	C	1						
Portugal	C	4					2	
Rumania	C	6,000						
Slovakia	C	332						
Spain	C	436	27					
Turkey	C	2,286						
Yugoslavia	C	6,977	457					
NORTH AMERICA [2]								
Costa Rica	C	2						
Dominican Republic	C	10						
Guatemala	C	1,545	158					
Jamaica	C	45	9		1	1		
Mexico	C	1,177	109					
Panama Canal Zone	C	1						
Puerto Rico (endemic)	C	129	31	5	1	3	1	1
Salvador	C	4						
Virgin Islands	C	6	13					
SOUTH AMERICA								
Bolivia	C	166	26					
Brazil	C	2	2					
Chile	C	341						
Colombia	C	268	17					
Curacao	C	2	2					
Ecuador	C	221	32					
Peru	C	571						
Venezuela	C	60	12					
OCEANIA								
Australia	C	142	10					
Hawaii Territory	C	42	5	6	3	4	4	

[1] A report dated Mar. 30, 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia.

[2] Cases of typhus fever listed in this area are probably of endemic type.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January—July 1449	August 1944	September 1944—week ended— 2	9	16	23	30
AFRICA								
Belgian Congo.								
Babeyru	D	2						
Banzyville	C	2	[1] 11					
Bondo	D	1						
Leopoldville	C	1						
Gold Coast.								
Cape Coast	C		[1] 1					
Kintampo	C	[1] 1						
Northern Territories	C	1						
Sekondi	C		[1] 1					
Tamale	C	1						
Yendi	C	[1] 1						
Ivory Coast Abidjan	C		1					
Portugese Guinea Port Blutam	C	1						
EUROPE								
Portugal Lisbon.[2]								
SOUTH AMERICA								
Bolivia:								
La Paz Department	C	1						
Santa Cruz Department	C	3						
Brazil								
Acre Territory	D	1						
Matto Grosso State	D	3						
Para State	D	2						
Colombia								
Boyaca Department	D	2						
Caldas Department	D	1						
Cundinamarca Department	D	1						
Santander Department	D	4						
Venezuela	C	-		3		3		

[1] Suspected.
[2] According to information dated Jan 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board.

COURT DECISION ON PUBLIC HEALTH

Disposal of wastes—joint order by State board of health and State committee on water pollution.—(Wisconsin Supreme Court; *American Brass Co. et al.* v. *Wisconsin State Board of Health et al.*, 15 N.W.2d 27; decided June 19, 1944.) The plaintiffs, two brass companies, brought an action to review an order concerning the disposal of pollutional wastes from their plants. The order was a joint one by the Wisconsin State Board of Health and the Wisconsin State Committee on Water Pollution. The conclusion of the State supreme court was that there was no authority in the statutes for the two bodies to proceed jointly and the judgment of the lower court affirming the order was reversed and the cause remanded to the trial court to set aside and vacate the order. The reasons for the judgment of the appellate court were as follows:

(*a*) An administrative agency has only such powers as are expressly granted to it or necessarily implied and any power sought to

be exercised must be found within the four corners of the statute under which the agency proceeds.

(*b*) The power conferred upon the State board of health to have "general supervision and control over the waters of the State, drainage, water supply, water systems, sewage and refuse disposal, and the sanitary condition of streets, alleys, outhouses, and cesspools, in so far as their sanitary and physical condition affects health or comfort" was clearly a power to be exercised by the board for the purpose of promoting the health and comfort of the people.

(*c*) The State committee on water pollution had power to exercise general supervision over the administration and enforcement of all laws relating to pollution of the surface waters of the State and to issue general and special orders for controlling the pollution of surface waters.

(*d*) The evident legislative purpose in enacting the statute relating to the committee on water pollution was to create an administrative agency with special authority to deal with the pollution of surface waters and that committee was not authorized to do anything else and was not required to take into consideration matters of public health and comfort.

(*e*) The State board of health and the State committee on water pollution were two separate and distinct bodies exercising power over separate and distinct matters.

(*f*) The mere fact that the power conferred upon the committee on water pollution complemented to a certain extent the powers conferred upon the State board of health did not warrant or imply any authority for the board and the committee to act jointly.

(*g*) Administrative agencies exercising legislative or judicial power or both powers in combination must be held to act within the limits prescribed by the statute creating them and they have no general legislative or general judicial powers but only those specifically granted or necessarily implied.

(*h*) Where two bodies join, as in the instant case, no one is able to say which authority was exercised or whether the authority was exercised by one or the other or whether the powers would have been exercised at all if the proceeding had been separate instead of joint.

(*i*) The defendants' argument, based upon the theory that it was difficult to tell which body had jurisdiction and that the circumstances might be such that the public interest would be advanced if the powers were exercised jointly, was one to be addressed to the legislature and not to the court.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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THE PROPHYLACTIC EFFECT OF SULFADIAZINE AND SULFAGUANIDINE AGAINST MOSQUITO-BORNE *PLASMODIUM GALLINACEUM* INFECTION IN THE DOMESTIC FOWL (PRELIMINARY REPORT) [1]

By G. ROBERT COATNEY, *Senior Malariologist*, and W. CLARK COOPER, *Passed Assistant Surgeon, United States Public Health Service*

Recent work by numerous investigators has shown that several of the sulfonamide compounds possess antimalarial properties when employed therapeutically against human, simian, and bird malaria. Only one report has come to our attention, however, in which a drug of this group has been tested prophylactically. Sinton, Hutton, and Shute in 1939 (*1*), reporting on the use of para-benzylaminobenzene-sulfonamide (proseptasine) in a small group of human subjects, state that this drug "appears to have a true causal prophylactic action" when employed against mosquito-borne infections of the Roumanian strain of *Plasmodium falciparum*.[2] The recent availability of *P. gallinaceum* Brumpt, which can readily be transmitted to the domestic fowl by *Aedes* mosquitoes, has given an opportunity to test two of these compounds, 2-(sulfanilamido)pyrimidine, (sulfadiazine), and para-aminophenylsulfonylguanidine monohydrate, (sulfaguanidine), prophylactically against experimental mosquito-borne malaria.

MATERIAL AND METHODS

A single strain of White Rock chicks was used throughout these studies. Chicks 3 to 7 days old were selected. For inoculation

[1] From the Division of Physiology, National Institute of Health The work described in this paper was done under a transfer of funds, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the National Institute of Health The manuscript was filed with the Committee on Medical Research on April 27, 1942, and released for publication on September 26, 1944

[2] Since this paper was filed for publication, we have found that Coggeshall, Maier, and Best in 1941 (*2*) had noted that promin failed to prevent or delay the development of *P cynomolgi* in monkeys when given prior to the intravenous inoculation of sporozoites

with sporozoites, one *Aedes aegypti* mosquito, previously fed on a parasitized bird and permitted to incubate for a suitable interval, was allowed to bite each bird. After biting, the mosquito was immediately dissected: if sporozoites were found in the salivary glands, the bird was considered successfully inoculated. If the mosquito was found to be negative for the infection, the procedure was repeated until a potentially infective bite was obtained. Blood smears were made daily on all test birds, beginning on the 6th day after the mosquito bite, and stained with Giemsa. Parasite estimations were recorded in terms of parasitized cells per 10,000 red blood cells, but actual counts are omitted from this report. Drugs were given orally by capsule twice daily, at 8:30 a. m. and 4:30 p. m., exposure to mosquitoes occurring between the first and second doses of the drug in all treated birds. Dosages given and periods of administration are indicated in the individual experiments. In reckoning the time of events, the day following a mosquito bite or an inoculation is the first day counted. Brain smears were made of all birds dying during the experiments; these were stained with Giemsa and examined for the presence of exoerythrocytic forms.

EXPERIMENTS AND RESULTS

Experiment 1.—A group of 24 chicks, 7 days old, was divided into 3 series of 8 birds each. Series A was given sulfadiazine, 1.0 milligram per gram of body weight, twice daily for 8 days. Series B received corresponding treatment using sulfaguanidine. Series C served as the control. All birds were bitten by infected mosquitoes as outlined above.

One bird in series B died on the 3rd day of the experiment The other birds in series A and B showed no evidence of infection for 35 days following the mosquito bites. In the control series one bird died on the 7th day with no evidence of infection, and another remained negative to the 35th day; the other six birds of the series first showed parasites in the blood between the 7th and 12th days, and all died of infection between the 10th and 16th days

To test for evidence of subpatent infection in the 15 birds of the 2 treated series and the 1 negative control, subinoculations were made on the 25th day. Seven hundredths (0.07) of a cc. of whole blood from each bird, mixed with 0.03 cc. of 2 5-percent sodium citrate solution, were given intravenously to each of 16 four-day-old chicks. None of these subinoculated birds became infected, as determined by daily smears continued for 30 days.

To test further for possible subpatent infection, each of the 16 original birds was inoculated intravenously with heavily parasitized blood on the 35th day after initial exposure, the dosage being adjusted to the weight of the bird. Smears made 5 minutes after each inoculation showed from 60 to 180 parasitized cells per 10,000 red blood cells. All birds developed heavy infections, 11 died on the 5th day after blood inoculation and all were dead by the 21st day. A bird of the same age that had survived an acute sporozoite-induced infection was inoculated intravenously at the same time; its parasite count 5 minutes after inoculation was 160 parasitized cells per 10,000 red blood cells, but on the following day no parasites could be found, and no significant alteration in the course of a typical chronic infection was detectable during subsequent observation for 21 days. This parallels

the findings of Ballif et al. in 1938 (3) and unpublished work of this laboratory on superinfection of birds having chronic infections with *P. gallinaceum*.

Experiment 2.—In an attempt to obtain confirmatory evidence of the definite prophylactic action shown by sulfadiazine when given as described in experiment 1, it was decided to repeat the work using a larger group of birds. Three-day-old birds were used instead of 7-day-old birds. The treated series and the control series consisted of 12 birds each. Drug administration and exposure to mosquitoes were as given in the former experiment.

Three of the treated birds died between the 7th and 9th days after being bitten without evidence of infection; the remaining nine have survived to this writing, for 36 days, without demonstrable parasitism. Among the controls, three are negative to date; the other nine first showed parasites in the blood between the 5th and 8th days; eight of these died of the infection between the 10th and 16th days, and one is alive after 36 days with a latent infection. Inoculation of the surviving birds with parasitized blood to test for subpatent infection was carried out on the 36th day; at this writing insufficient time has elapsed for reporting the results of these tests.

Experiment 3.- The prophylactic action of sulfadiazine was so definite in the preceding experiments that it was decided to set up another experiment in which only 0.5 milligram per gram of the drug would be given twice daily and for only 4 days. A group of 20 chicks, 3 days old, was divided into 2 series, 12 test birds and 8 controls. All 20 birds were bitten by infected mosquitoes.

One treated bird died on the 7th day without evidence of infection; the other 11 birds have survived 23 days to date without demonstrable parasitism. Of the control series, one died on the 7th day without evidence of infection, and one is still negative after 23 days. The other 6 controls first showed parasites in their blood between the 8th and 12th days, and all died of the infection between the 12th and 19th days of the experiment.

Experiment 4.—The strong presumptive evidence for prophylactic action by sulfaguanidine in experiment 1 prompted an attempt to repeat the experiment using 3-day-old chicks, with 12 treated and 6 control birds. Some difficulty was experienced in getting the mosquitoes to bite on this occasion with the result that 6 of the 12 treated and 4 of the 6 control birds had to be injected mechanically with sporozoites suspended in physiological saline solution.

One treated bird died on the 8th day without evidence of infection, and two became infected, parasites appearing in the blood of one on the 18th day and in the other on the 20th day after exposure; the remaining nine are negative at this writing, 29 days after exposure. The control birds all showed parasites in the peripheral blood between the 8th and 11th days, and all died of the infection between the 12th and 16th days.

Experiment 5.—This experiment was set up to parallel experiment 3 in age of chicks, dosage, and time; the drug used was sulfaguanidine. Twelve chicks were given the drug, 0.5 milligram per gram twice daily for 4 days; the control series was the same as that used for experiment 3.

Seven of the treated group are negative for the infection to date, after 23 days; the other five first showed parasites in their blood between the 11th and 18th days of the experiment; two have died, one on the 15th and the other on the 20th day of the experiment. Data on the controls are given under experiment 3.

Other experiments.—Further work is in progress, with special emphasis on sulfadiazine, to determine the minimum oral dosage that will result in definite prophylactic effect, the blood level necessary for this effect, and the stage in the life cycle of the parasite that is vulnerable to these drugs. Preliminary results indicate that the blood

levels reached at the dosages used in the above experiments are considerably higher than levels ordinarily obtained in routine use of these drugs in human subjects.

SUMMARY AND CONCLUSIONS

Sulfadiazine was given to 2 series of chicks at a dosage of 1.0 milligram per gram twice daily for 8 days and to one series at a dosage of 0.5 milligram per gram for 4 days, beginning just prior to bites by *A. aegypti* mosquitoes infected with *P. gallinaceum*. None of the treated birds developed malaria. Sulfaguanidine was given according to the same plan; 2 of 20 birds receiving the higher dosage and 5 of 12 birds receiving the lower dosage became infected. Of the 34 control birds, 27 developed typical infections.

These data lead us to believe that sulfadiazine has decided prophylactic action against mosquito-borne *P. gallinaceum* infection in the chick; sulfaguanidine at the same oral dosage is considerably less effective.

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THE RELATION OF PARTICLE SIZE TO THE EFFECTIVENESS OF PARIS GREEN USED IN AIRPLANE DUSTING FOR MOSQUITO CONTROL [1]

By R. L. METCALF and A. D. HESS

The application of paris green dusts by airplane is at present the most economical means of larvicidal control of *Anopheles quadrimaculatus* in extensive breeding areas. Cost records for this type of work over a number of years in the reservoirs of the Tennessee Valley Authority have shown that approximately two-thirds of the total cost of the airplane dusting program is for paris green larvicide. Studies by Hinman, Crowell, and Hurlbut (*1*) and Krusé, Hess, and Metcalf (*2*) have shown that, under ideal airplane dusting conditions, only about 25 percent of the total amount of paris green released reaches the treatment area. The remainder is dissipated by winds and propeller torque. It is therefore evident that a means of increasing the percentage of larvicide reaching the water surface of

[1] From the Biology Section, Health and Safety Department, Tennessee Valley Authority, Wilson Dam, Ala. Submitted for publication March 16, 1944

the treatment area could effect an appreciable saving in the cost of larvicidal operations.

The settling rate of very small particles of paris green in air, assumed to act in accordance with Stokes' law, indicates that a particle 20 microns in diameter settles 25 times as fast as one of 4 microns in diameter. If the dusting were carried out in absolutely still air, the rate of settling would be of no consequence, but even under conditions of very slight air movements the drift of small particles becomes significant. The average wind velocity recorded for 18 predawn dusting experiments was about 1.5 miles per hour. Assuming a 1-mile-per-hour wind, a particle 4 microns in diameter, released from the routine dusting height of 20 feet, would drift approximately 5,000 feet, while a particle 20 microns in diameter would drift only 200 feet. It should be emphasized that the settling action of the dust cloud immediately following its release from the plane is not entirely in accordance with these theoretical settling rates. The influence of the propeller torque gives it a spiral motion and largely neutralizes the wind action for several seconds following discharge. The dust cloud, however, quickly becomes subject to wind action and the relative rates of settling under field conditions appear to conform with the theoretical values outlined above.

From these considerations it appeared that a paris green dust with particles as large as were compatible with larvicidal requirements would be ideal for airplane dusting. However, the present manufacturing trends seem to be directed toward the production of paris green with particles of extreme fineness. Current specifications for paris green to be used as an anopheline larvicide provide a limit on the maximum particle size but set no limit on the minimum particle size. Correspondence with leading manufacturers indicates that the paris green which is currently being supplied for airplane dusting is of much finer particle size than required to meet larvicidal specifications. The standard paris greens of four different manufacturers range from 87 to 100 percent by weight below 20 microns in diameter, and in one case 78 percent is below 10 microns.

This information seemed to indicate the desirability of developing specifications which would set a minimum, as well as a maximum, limit on the particle size composition of paris green to be used as an anopheline larvicide. Accordingly, the writers conducted a series of studies during the season of 1943 to determine the relation of particle size to larval toxicity and dust distribution in order that more appropriate specifications might be developed.

EXPERIMENTAL

Relative ingestibility of various sized particles.—The maximum size particle which an *Anopheles* larva can ingest will limit the particle

size composition of a larvicide. Shipitzina (3) has determined the maximum size of particles which can be ingested by *A. maculipennis*, but no records of this factor were available for *A. quadrimaculatus*. The following experiment was therefore conducted:

Finely ground Berkshire sand, with particles from 1 to 300 microns in diameter, was dusted upon the water surfaces of clean watch glasses containing insectary-reared *Anopheles quadrimaculatus* larvae. The larvae were allowed to feed for 1 hour and were removed and placed in distilled water. Twenty larvae of each of the four instars were then crudely dissected and the cross-sectional diameter of the largest particle found in the alimentary tract of each was measured with a calibrated ocular micrometer. The results are indicated in table 1, together with the ratio of particle ingestion to head diameter in the post-occipital region. The figures of 29, 51, 68, and 106 microns, representing the average maximum-ingestion diameters for each of the four instars, are in quite close agreement with Shipitzina's results for *A. maculipennis*. For practical purposes the average maximum-ingestion diameters may be taken as 25, 50, 75, and 100 microns for the first to fourth instars, respectively.

TABLE 1.—*Maximum size of particles ingested by larval instars of* Anopheles quadrimaculatus

Instar	Number of larvae	Diameter in microns of largest ingested particles		Ratio of diameter of largest ingested particle to head width at post-occiput
		Range	Average	
First	20	18- 37	[1] 29±1 2	18
Second	20	42- 70	[1] 51±1 6	19
Third	20	44- 99	[1] 68±2 6	17
Fourth	20	88-131	[1] 106±3 0	19

[1] Standard error of the mean.

Median lethal dosage of paris green to fourth instar Anopheles quadrimaculatus *larvae*.—An important consideration of the relationship of particle size to effectiveness is the minimum amount of paris green necessary to kill a single larva. This was determined by the individual feeding of larvae in the following manner. A number of vigorous fourth instar larvae from an insectary colony kept under constant conditions of temperature and humidity were isolated each morning before feeding and were placed in clean water. A single larva was placed in a small Syracuse dish which was then observed under a binocular microscope. An approximately spherical particle of crystalline paris green of appropriate size was measured by means of a calibrated ocular micrometer in a compound microscope and was lifted by adhesion on the tip of a dissecting needle and transferred to the surface film of the water in the Syracuse dish. By guidance with the needle point, the particle was moved into the current created by the mouth parts of the larva while feeding and was observed until it was

ingested. By using transmitted light, the particle could be observed after it had entered the gut of the larva. Thus, it was possible to determine that the particle of paris green was retained by the larva and not regurgitated. After feeding, the larvae were isolated in small dishes of clean water and observed for mortality over a 24-hour period. The results are shown in table 2. They indicate that particles of paris green approximately 40 microns in diameter will kill about one-half of the larvae feeding on them. The weight of a 40-micron particle was approximately 0.0001 mg. (calculated from the volume of a sphere), using 3.22 gm. per cc., the density of paris green as given by Goodhue and Gooden (*4*), and the average live weight of 30 fourth instar larvae was 0.0023 gm. From these figures, the median lethal dosage of paris green would be 0.05 mg. per gm. of body weight. For purposes of comparison the following determinations of median lethal dosages of paris green for other insects are quoted from Shepard (*5*): Cabbage worm, 0.04; grasshopper, 0.19; Colorado potato beetle, 0.1; and cotton leafworm, 0.01.

TABLE 2.—*Toxicity of individual particles of paris green to fourth instar* Anopheles quadrimaculatus *larvae*

Number larvae fed	Diameter of particle fed (microns)	Estimated particle weight (milligrams)	Percent mortality
4	110-118	0.0022-0.0027	100
4	87-100	0.0012-0.0017	100
5	60-75	0.0004-0.0007	100
5	50	0.0002	80
10	40	0.0001	40

Relation of particle size of paris green to toxicity.—In general, the toxicity of a stomach poison insecticide increases with a decrease in the size of its component particles (*6*). To determine this relationship for paris green larvicides, attempts were made to obtain pure size fractions of paris green by screening and by air classification. Equal quantities were compared in pan tests at a constant temperature of 85° F., the larvicide being dispersed on the water surface by means of a dust settling tower (figs. 1 and 2). The larvae used were insectary-reared under conditions of constant temperature and humidity. Table 3 presents the data obtained. With first instar larvae the finer-sized particles acted more quickly, but there was no significant difference in the final kill obtained at the end of 2 hours except with the 50–75-micron material. This 50–75-micron fraction theoretically could not be ingested by first instar larvae, but the mortality produced indicates that some smaller particles were present in spite of repeated screening, and this was confirmed by microscopic examination. The slower action of the No. 5 air-classified material can be explained by

the complete absence of very small particles, as these were totally removed in the air classifier. None of the fractions showed an appreciable difference in the final mortality to fourth instar larvae at the end of 2 hours.

TABLE 3.—*Percent mortality of* Anopheles quadrimaculatus *larvae with various sized fractions of paris green*

Material	Approximate particle size (microns)	First instar percent mortality				Fourth instar percent mortality			
		Number of larvae	30 minutes	1 hour	2 hours	Number of larvae	30 minutes	1 hour	2 hours
Colloidal	<1	52	92	96	100	80	33	81	91
Air-classified	7-30	56	25	79	97	77	16	56	82
Through 325 mesh	1 50	50	56	96	98	45	36	69	67
325-200 mesh	50-75	50	0	30	38	78	58	81	91
Control	-	40	0	0	7 5	40	0	0	0

The results of the above tests indicate that the particle size of paris green can be increased considerably without any significant reduction in its toxicity to anopheline larvae. It is thus apparent that the ideal paris green for airplane dusting should contain a higher percentage of large particles than the materials which are generally available commercially. Ideal particle size specifications were therefore drawn up, based on the ingestibility data. These specifications set a maximum allowance of 25 percent by weight for particles under 20 microns in diameter, and provided for the remainder to be approximately evenly distributed in two fractions of 20–50 and 50–100 microns, with a 5-percent allowance for particles over 100 microns in diameter. These specifications were submitted to four leading manufacturers to find out if they could be met on a practical basis. Little interest was shown in meeting these specifications, but one manufacturer submitted a paris green which represented a compromise between the specifications and practical manufacturing requirements. This material was produced at no increased cost merely by modifying the grinding process. A particle size analysis of this "coarse" paris green compared with the "regular" paris green supplied for airplane dusting is shown in table 4.

TABLE 4.—*Particle size composition of regular and coarse paris green*

	Particle diameters in microns							
	0-3		3 7		7-20		20-50	
	Percent by weight	Percent by number	Percent by weight	Percent by number	Percent by weight	Percent by number	Percent by weight	Percent by number
Regular paris green	1	54	8	26	41	18	50	2
Coarse paris green	1	54	2	21	9	15	88	10

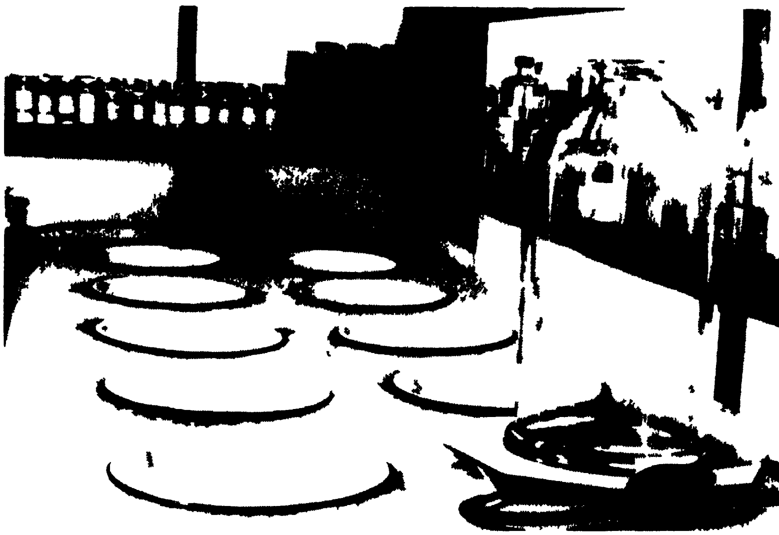

FIGURE 1.—Constant temperature bath and larvicidal testing pans with bell jar used as settling tower

FIGURE 2.—View of dust distributing apparatus with bell jar removed

It will be noted that, although there is a significantly greater amount of large-particle material in the coarse paris green, there are still a very large number of smaller particles present. When the percent by weight of each fraction is considered, the coarse paris green contains about 40 percent more material in the "20 microns and above" fraction, while the percent by weight in the "under 3 microns" fraction is almost identical for the two materials. The two materials were pan tested for comparative toxicities to first and fourth instar *Anopheles quadrimaculatus* larvae. Although there was some indication that the regular material had a more rapid effect, there was no significant difference in the final mortality obtained at the end of 3 hours as shown by the data presented in table 5.

TABLE 5.—*Comparative toxicity of regular and coarse paris green to* Anopheles quadrimaculatus *larvae*

	Percent mortality							
	30 minutes		1 hour		2 hours		3 hours	
	First instar	Fourth instar	First instar	Fourth instar	First instar	Fourth instar	First instar	Fourth instar
Regular	73±8	32±12	98±1	70±10	98±1	94±2	99±1	99±1
Coarse	72±5	19±7	92±4	54±10	94±4	85±4	97±2	96±2

Airplane dusting field tests.– A detailed comparison of the regular and coarse paris greens was made by studying the results of dust distribution by airplane. Both materials were diluted for application in the same way, i. e., as 22.2 percent paris green in soapstone.

The cross-sectional distribution of the dusts was determined by collection of the dust in petri dishes placed in groups of four at 20-foot intervals along two 200-foot transects. The flight was made approximately 20 feet above the center of the transects and at right angles to them. The dust in the petri dishes was analyzed chemically for arsenical content by the standard microbromate titration (*7*), four replicates being obtained at each sampling point. The results were expressed in recovery of paris green in pounds per acre By comparing these with the total dust release (*2*), a figure was obtained for the percent recovery of dust at each sampling point along the 200-foot swath.

Five flights were made with each dust, giving a total of 10 cross sections with each material. The averages of these 10 sections for regular and for coarse paris green are plotted graphically in figure 3. The total percent recoveries over a 200-foot swath were 26.5 percent for the regular dust, and 42.8 percent for the coarse dust. Thus, the use of the coarse dust increased the amount of material reaching the treatment area by 60 percent. A few routine field tests were made

with the large-particle dust. In 2 of these tests where the larval population was measured before and after treatment 90 to 100 percent larval mortality was secured. Since the coarse material gave a 60-percent increase in recovery and equally satisfactory kills, its use is recommended in place of the regular material.

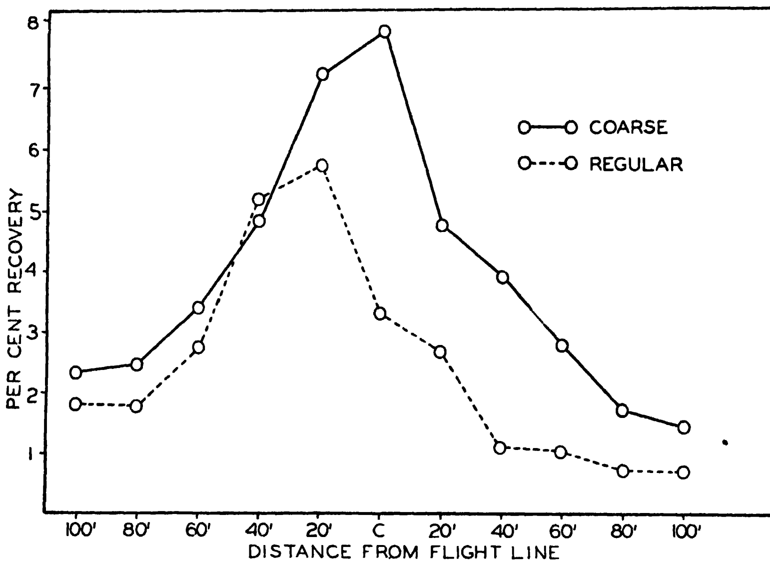

FIGURE 3.—Graph showing percent recoveries of coarse and regular paris greens at varying distances from the line of flight, each value representing the average of 10 measurements

SUMMARY

Previous studies have shown that in airplane dusting operations for the control of *Anopheles quadrimaculatus* larvae an average of approximately 75 percent of the paris green dust drifts away from the treatment area due to its fine particle size. Studies were therefore undertaken to determine if the efficiency of the operation could be improved by increasing the particle size of the dust. Laboratory experiments showed that the average maximum diameter of particles ingested by first to fourth instar *Anopheles quadrimaculatus* larvae were 29, 51, 68, and 106 microns, respectively. The median lethal dose of paris green to fourth instar *A. quadrimaculatus* larvae was 0.05 mg. per gm. of body weight or the equivalent of a particle about 40 microns in diameter. Toxicity tests with fourth instar larvae showed no significant difference between paris green particles 1 micron or less in diameter and those 50 to 75 microns in diameter. A special paris green was purchased which had a particle size analysis of 84 percent by weight from 20 to 50 microns in diameter. This was compared by airplane dusting with standard paris green which had 48 percent by weight in this size range. The use of the coarse dust resulted in a 60 percent increase in the amount of dust reaching the treatment

area. Field tests with the coarse dust under average conditions gave a larval kill of 90 to 100 percent. Manufacturing costs for the large dust were no greater than for the standard product. It is therefore believed that specifications for paris green to be used in airplane dusting should be revised to encourage the production of a material with a more desirable particle size composition.

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PROVISIONAL MORTALITY RATES FOR THE FIRST QUARTER OF 1944

The mortality rates in this report are based upon preliminary data for 39 States, the District of Columbia, Alaska, Hawaii, and the Canal Zone. Comparative data for the first quarter of 1943 and 1942 are also presented for 33 States and the District of Columbia.

This report is made possible through a cooperative arrangement with the respective States, which furnish provisional quarterly tabulations of current births and deaths to the United States Public Health Service. Because of some lack of uniformity in the method of classifying deaths according to cause, as well as some delay in filing certificates, these data are preliminary and some deviation from the final figures may be expected, especially for specific causes of death for individual States. Nevertheless, it is believed that the trend in mortality within each State is reasonably accurate. Comparison of specific causes of death for different States, however, is subject to error because of the factors mentioned above.

Population estimates for the different States used in computing rates were as follows: 1942 and 1943 populations are Bureau of the Census estimates of the civilian population as of July 1 of each year; 1944 populations were obtained from these, that is, a 9-month change based on the 1942 and 1943 estimates was added to the 1943 estimates to give April 1, 1944, populations.

The crude mortality rate from all causes during the first 3 months of 1944 was 12.0 per 1,000 population (annual basis), as compared with

11.4 and 11.3 for the corresponding periods in 1943 and 1942, respectively. In connection with the increase in the crude mortality rate for all ages, the effect of recent changes in the age distribution of the population was discussed in the annual report of this series, appearing in the August 11 issue of the Public Health Reports. It was shown that an age adjustment of rates for 1943 to the 1940 age distribution of the population materially reduces the crude death rates. A summary of annual rates for all causes, 1941–43, both crude and adjusted to the 1940 age distribution of the population, is as follows:

Provisional mortality from all causes, 39 States

[Rate per 1,000]

Year	Crude	Adjusted to 1940 age distribution	Percentage excess of crude over adjusted rate
1943	10.87	10.32	5.3
1942	10.32	9.90	4.2
1941	10.43	10.18	2.5
1940	10.65	10.65	0.0

The last column of the above table shows the precentage excesses in the crude rates which are the result of an older age distribution of the population, that is, the rate for 1942 was raised approximately 4 percent, and that for 1943, 5 percent, by changes in the age distribution of the population brought about mainly by the removal of troops from the country. Since the effect of the withdrawal of troops from the population is cumulative, the crude rate for 1944 would be increased relatively more than 1943. In order to adjust for age the quarterly rates shown in detail in the following table, it would be necessary to know the number of deaths in each age group during the first quarter of 1940; these, however, are not published by the Bureau of the Census We can, nevertheless, roughly appraise the observed increase in mortality from all causes for the first quarter, 1942–1944, as shown in the table. If adjustment for age makes approximately the same difference in quarterly as in annual rates then the crude quarterly rate for 1942 should be lowered by 4 percent, 1943 by 5 percent, and 1944 by an estimated 6 percent of the respective rates, to allow roughly for changes in age distribution. This process would give rates of 10.9, 10.9, and 11.3 per 1,000 for 1942, 1943, and 1944, respectively; or an increase of 4 percent in mortality for the first quarter, 1943 to 1944. It seems likely, therefore, that there has been some increase in mortality during the first quarter of 1944 over the first quarter of 1943, even when the age distribution of the population is taken into account. The increase in the crude death rate was widespread; 21 of the 34 States reporting had higher rates in 1944 than in 1943, in 11 States the rate was lower, and in 2 States the rate was the same in both

years. The death rate from all causes among persons insured in the Metropolitan Life Insurance Co. for the first 3 months of the year was 9.1 per 1,000 persons, as compared with 8.5 in 1943 and 8.1 in 1942. At least part of the observed increase in mortality from all causes is due to deaths from influenza and pneumonia during the epidemic of December 1943 and January 1944, mentioned later.

The increase in the total death rate resulted from some increase in all of the important diseases except nephritis and accidents other than automobile accidents. For nephritis the rate for 1944 was the same as in 1943 and was slightly below the rate in 1942. The total accident death rate also stood at the level of 1943. Deaths from automobile accidents, however, increased more than 20 percent; the rate was higher in 1944 than in 1943 in 24 of the reporting States. An outbreak of influenza reached its peak during January of 1944 and 32 of the 34 States reporting had a higher death rate in 1944 than in 1943; for the group of States the rate was higher than in either of the 2 preceding years. Fourteen of the States had higher pneumonia rates; 19 had lower rates than in 1943, and in 1 State the rate was the same. Higher tuberculosis death rates appeared in all sections of the country; 21 of the 34 States reported a higher rate than in 1943, and in 13 of the States the rate was lower. For cancer, diabetes mellitus, intracranial lesions of vascular origin, and diseases of the heart, from 21 to 24 of the 34 States reported increases over 1943 in the death rate from these diseases. Increases of 5 percent or more, seen, for example, in mortality from tuberculosis, cerebral hemorrhage, and heart disease in the first quarter of 1944 compared with the corresponding quarter of the preceding year, 1943, are probably not due entirely to changes in age distribution of the population. During past influenza epidemics other causes, particularly chronic diseases, have increased along with influenza and pneumonia. Measles was the only one of the four common childhood diseases to have a higher rate in 1944 than in 1943 or 1942.

The severe outbreak of meningococcus meningitis that started in the latter part of 1942 has continued on into 1944 and the severity of the outbreak has been reflected somewhat in the death rate. Twenty-four of the 34 reporting States contributed to the rate of 3.6 per 1,000 inhabitants for the first 3 months of 1944, as compared with a rate of 2.4 in 1943 and 0.6 in 1942.

Both the infant and maternal mortality rates continued to decline; 17 of the 33 States with available data reported a lower infant mortality rate in 1944 than in 1943 and 21 of the same group of States reported a lower maternal mortality rate.

The birth rate for the first 3 months of 1944 declined more than 5 percent from the 1943 rate, but it was still above the rate in 1942. Only 8 out of the 33 States reported an increase over 1943, 23 showed a decrease and in 2 States the rate was the same for both years.

Provisional mortality from certain causes in the first 8 months of 1944 with comparative data for the corresponding period in preceding years

State and period	All causes, rate per 1 000 population (annual basis)	Births (exclusive of stillbirths) per 1 000 population (annual basis)	Rate per 1 000 live births: Total infant mortality	Rate per 1 000 live births: Maternal mortality	Death rate per 100 000 population (annual basis): Typhoid and paratyphoid fever (1 2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and polioencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis all forms (13 22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107 109)	Cancer, all forms (45 55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90-95)	Nephritis all forms (130-132)	All accidents, including automobile accidents (169-195)	Automobile accidents (170a b c)
34 States [1]																									
1944	12.0	19.3	43	2.2	0.2	0.4	3.5	0.5	0.7	1.5	2.0	3.6	0.1	0.6	43.4	11.1	37.3	76	131	31.3	106	370	80	63	16.3
1943	11.4	20.5	44	2.3	.3	.4	3.8	.5	.8	2.3	1.2	2.4	.2	.5	41.1	11.8	15.4	72	122	29.7	101	350	80	63	13.3
1942	11.3	18.9	46	2.8	.3	.4	3.2	.5	.9	2.0	1.5	.6	.2	.4	43.2	12.2	14.9	70	126	29.4	101	333	82	67	22.5
Industrial policyholders [2]																									
1944	9.1				.2		[3] 3.1	.6	.9	[illegible]	1.4				44.0	[illegible]	25.0	57	111	33.8	75	[4] 269	[5] 55	54	16.0
1943	8.5				.1		[3] 2.9	.4	.8	1.4	.5				40.8	10.9	9.3	50	110	31.4	73	[4] 261	[5] 56	48	12.2
1942	8.1				.1		[3] 3.7	.6	.6	1.0	.6				43.8	10.8	7.6	42	107	31.5	66	[4] 244	[5] 58	50	20.7
Alaska																									
1944	22.4	21.4	137	(6)	(6)	(6)	(6)	(6)	5.2	103.1	61.8	(6)	(6)	(6)	401.9	(6)	97.9	170	67	5.2	103	206	26	448	20.6
1943	19.9	21.2	124	(6)	(6)	(6)	(6)	(6)	(6)	57.6	41.9	(6)	(6)	(6)	361.5	10.5	104.8	215	89	10.5	63	215	21	252	10.4
1942	16.2	26.5	107	2.0	(6)	(6)	10.[illegible]	(6)	5.3	16.0	5.3	(6)	(6)	(6)	239.8	(6)	26.6	112	91	16.0	59	2[illegible]3	37	256	10.7
Canal Zone																									
1944	8.7	22.2	29	11.0	(6)	8.2	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	40.8	32.6	(6)	33	82	16.3	41	114	16	244	32.6
1943	10.5	20.8	49	3.8	(6)	(6)	[illegible]8	(6)	(6)	(6)	(6)	(6)	(6)	(6)	62.6	7.8	(6)	24	39	23.5	63	[illegible]8	39	344	31.3
Colorado																									
1944	10.5	22.2	47	2.1	(6)	(6)	4.4	.3	3.4	4.0	5.1	3.4	1.0	.3	40.1	7.8	31.7	91	114	21.9	81	283	58	61	10.5
1943	11.5	20.5	49	2.4	(6)	(6)	2.8	1.0	1.7	1.0	3.5	5.9	(6)	.7	48.5	8.7	23.4	109	122	17.4	87	296	74	78	12.2
1942	12.8	19.6	62	2.8	.7	(6)	.4	1.5	1.5	4.4	1.8	.4	[illegible]	.4	60.6	12.1	12.8	121	130	21.6	111	293	90	106	35.4
Connecticut																									
1944	12.0	17.0	38	1.1	(6)	.2	[illegible]	.2	(6)	(6)	.2	5.9	(6)	.2	37.4	7.5	13.2	63	163	37.9	107	411	71	59	13.5
1943	10.1	16.4	34	1.4	(6)	(6)	2.1	.2	(6)	.9	.2	1.6	(6)	.7	26.9	5.2	3.9	47	136	32.6	95	364	54	56	13.4
1942	9.4	14.4	32	3.0	(6)	(6)	3.0	(6)	(6)	.2	.2	.5	(6)	(6)	33.4	6.8	3.0	31	121	33.6	85	325	64	51	15.5
Delaware																									
1944	12.6	22.9	45	.6	(6)	(6)	20.1	(6)	(6)	(6)	2.9	2.9	(6)	(6)	45.9	12.9	43.0	93	119	40.2	98	382	122	80	34.4
1943	14.0	19.7	48	4.3	(6)	(6)	4.3	(6)	(6)	8.5	(6)	14.2	(6)	(6)	49.8	17.1	17.1	115	134	39.8	124	469	152	64	18.5
1942	12.7	18.2	38	(6)	(6)	(6)	4.4	2.9	(6)	(6)	(6)	(6)	(6)	(6)	56.7	11.6	11.6	93	116	20.4	132	445	122	64	17.4

District of Columbia																									
1944	11.2	25.7	38	1.9	(6)	(6)	8.9	1.3	(6)	(6)	1.3	3.1	(6)	(6)	70.7	23.7	5.4	94	120	30.4	66	326	95	70	11.6
1943	11.7	27.1	38	1.8	(6)	(6)	5.5	.9	(6)	4.1	.9	3.2	(6)	(6)	55.6	15.0	8.2	85	137	31.4	65	344	103	54	10.0
1942	10.8	23.8	41	2.2	(6)	(6)	9.8	(6)	(6)	4.7	(6)	1.4	(6)	(6)	56.7	21.1	6.1	80	121	24.8	76	296	99	66	20.2
Florida																									
1944	11.0	18.4	46	3.0	.7	1.1	4.8	(6)	1.0	2.1	.8	2.7	(6)	(6)	33.3	16.8	44.8	65	88	21.2	95	278	78	109	23.8
1943	10.9	17.7	52	3.6	.3	1.0	6.8	.5	1.9	2.7	.7	3.1	.3	.5	33.6	19.3	28.6	57	92	20.0	102	268	78	103	20.9
1942	11.9	17.7	59	3.7	1.9	2.3	6.8	.2	2.5	1.5	4.9	1.1	(6)	.2	44.2	16.7	[illegible]	69	93	21.4	118	305	71	91	33.2
Georgia																									
1944	8.0	19.9	46	3.2	.1	.4	2.3	(6)	.1	2.0	4.0	3.7	.1	.1	30.5	10.8	18.0	58	54	10.3	86	162	77	42	14.9
1943	8.1	21.2	50	3.3	.1	.1	3.9	.3	.1	5.4	.4	1.8	(6)	.4	33.2	10.9	26.9	64	[illegible]	12.4	80	160	87	51	12.1
1942	8.6	18.8	67	3.2	.3	1.1	2.8	.1	1.5	1.9	4.4	.5	.3	.1	38.3	12.8	28.7	74	55	11.8	88	155	91	57	20.7
Hawaii																									
1944	8.3	27.1	38	2.3	(6)	1.8	8.2	(6)	(6)	.9	(6)	2.7	(6)	(6)	62.6	19.1	2.7	42	84	11.8	52	163	45	116	27.2
1943	7.6	24.9	48	1.1	(6)	.9	13.7	(6)	.9	.9		1.8	(6)	(6)	56.6	[illegible]	3.6	[illegible]	76	[illegible]	47	132	51	101	15.5
1942	7.2	23.2	43	1.2	2.8	(6)	6.4	(6)	(6)	.5		.9	(6)	(6)	41.3	7.3	4.6	61	[illegible]	12.8	32	142	66	72	19.3
Idaho																									
1944	9.9	24.0	30	(6)	(6)	(6)	(6)	.8	(6)	(6)	.8	[illegible]	(6)	(6)	14.2	(6)	51.4	145	74	4.0	67	327	58	68	14.2
1943	9.7	24.9	36	2.6	.8	.8	(6)	.8	1.6	(6)	[illegible]	1.1	(6)	.8	19.5	4.1	17.9	[illegible]	104	17.1	[illegible]	288	73	73	14.7
1942	10.3	23.4	41	1.4	.8	(6)	(6)	(6)	.8	.8	.8	(6)	(6)	.8	18.7	2.5	14.4	59	[illegible]	19.5	109	300	66	84	19.5
Illinois																									
1944	12.9	17.3	38	1.9	.1	.4	2.4	.7	.4	.6	2.6	4.0	(6)	.4	45.1	12.6	20.6	55	166	38.8	99	462	92	58	16.3
1943	12.3	19.1	38	2.1	.2	.3	3.1	.5	1.1	1.5	.4	1.3	.1	.1	43.4	12.0	8.4	[illegible]	154	34.1	101	437	97	63	15.1
1942	11.7	16.6	37	2.3	.2	.6	1.1	.6	1.0	1.2	.6	.2	.2	.1	41.2	12.5	8.7	53	149	35.7	96	390	97	67	24.5
Indiana																									
1944	12.7	19.9	40	1.8	1.2	.1	4.3	.6	1.1	.7	3.3	4.7	.4	.7	35.8	10.0	66.5	89	133	14.6	162	322	90	67	18.4
1943	12.9	22	45	2.5	.2	.1	5.1	.7	.6	2.6	3.6	1.3	.2	.2	35.5	9.4	27	91	124	18.4	152	302	99	67	16.5
1942	11.5	18.2	38	3.7	.2	.2	2.3	.5	.7	1.2	.2	(6)	.3	[illegible]	40.2	[illegible]	29.1	73	122	12.4	143	282	81	73	30.5
Iowa																									
1944	12.6	18.7	41	2.3	(6)	(6)	2.0	1.3	.2	1.3	1.6	1.5	(6)	.7	18.3	7.6	64.5	67	150	29.9	138	392	74	69	14.3
1943	11.4	19.3	40	3.4	.2	.2	1.0	1.6	.5	.9	.9	1.2	(6)	(6)	15.4	7.7	15.4	57	141	31.5	137	[illegible]	70	69	11.4
1942	10	19.8	35	2.8	(6)	.2	2.2	.2	.2	1.5	1.3	(6)	.2	.5	14.7	6.3	14.5	54	143	25.4	120	313	62	67	18.2
Kansas																									
1944	12.2	20.2	34	2.7	(6)	.2	2.3	1.4	1.1	.9	1.8	2.9	.5	1.8	19.1	11.3	60.3	64	136	35.6	116	353	96	75	14.9
1943	12.4	20.4	41	1.7	(6)	.2	1.6	1.8	.7	2.0	.5	1.8	[illegible]	1.8	25.7	10.0	28.0	62	134	30.7	134	370	95	86	15.3
1942	11.6	18.7	39	2.0	(6)	(6)	3.0	.9	(6)		1.4	.2	.2	1.4	25.2	10.6	30.8	52	131	32.4	131	339	99	75	22.2
Kentucky																									
1944	11.0	19.7	63	2.0	.3	.9	3.9	.3	1.5	3.3	3.9	4.4	.2	1.1	70.2	9.3	71.1	97	88	19.1	106	270	75	60	14.9
1943	10.2	21.5	56	2.2	.6	.6	4.9	.3	1.0	4.3	6.1	3.0	.4	.6	60.4	10.7	29.8	95	[illegible]	14.5	102	258	79	56	10.1
1942	9.9	16.9	69	3.8	.8	[illegible]	3.3	1.4	2.4	4.8	1.4	1.2	.5	.1	59.2	8.5	29.9	88	77	14.4	92	239	80	73	16.0
Louisiana																									
1944	10.1	21.1	52	3.2	.5	1.3	6.5	.2	3.3	2.5	.3	3.0	.2	.2	48.0	18.4	52.6	64	87	16.5	75	261	71	74	19.8
1943	9.8	22.4	49	3.4	1.0	1.0	5.4	(6)	.5	3.5	1.0	1.3	.2	.2	53.1	17.5	21.1	69	82	17.1	75	252	73	52	12.1
1942	9.7	20.1	58	3.2	1.3	.8	6.4	(6)	2.5	1.8	1.4	1.1	.3	[illegible]	46.9	22.1	24.7	68	85	17.3	68	245	75	56	17.5
Maine																									
1944	14.5	21.0	53	.9	(6)	(6)	6.9	(6)	(6)	2.5	2.0	2.5	(6)	(6)	32.8	4.0	57.1	83	147	30.8	138	417	101	78	11.4
1943	15.1	23.2	63	1.5	(6)	(6)	6.9	.5	(6)	5.5	.5	11.4	1.0	(6)	30.7	11.9	26.3	106	160	29.3	156	484	121	83	13.9
1942	13.6	20.8	46	1.9	.5	(6)	6.4	1.0	(6)	1.0	3.9	1.5	(6)	1.0	29.9	8.8	19.1	66	154	37.2	145	397	89	71	23.5
Maryland																									
1944	12.3	19.4	48	1.6	(6)	.2	7.1	.2	.7	2.2	3.7	3.2	.2	.4	74.6	16.3	22.7	81	121	35.4	94	372	123	66	14.4
1943	12.5	22.3	44	1.2	.6	(6)	7.0	(6)	.8	2.5	.6	6.4	(6)	.4	63.4	15.1	7.6	88	127	32.4	102	387	126	70	15.7
1942	12.1	17.6	50	2.2	.2	(6)	4.3	.4	.4	.6	1.2	2.6	(6)	.6	69.1	18.1	8.3	86	130	31.3	101	364	122	70	27.2

See footnotes at end of table

Provisional mortality from certain causes in the first 3 months of 1944, with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid and paratyphoid fever (1, 2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and polioencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis, all forms (13-22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107-109)	Cancer, all forms (45-55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90-95)	Nephritis, all forms (130-132)	All accidents, including automobile accidents (169-195)	Automobile accidents (170, b)
Massachusetts																									
1944	14.1	[illegible]	[illegible]	[illegible]	2	2	2.5	3	1	.5	1	3.3	[illegible]	.6	45.3	6.9	14.3	10[illegible]	18[illegible]	41.7	122	[illegible]23	[illegible]9	71	14.6
1943	14.1	[illegible]	[illegible]	[illegible]	3	1	[illegible]8	1.0	2	1.2	6	2.9	1	1	4[illegible]	[illegible]0	2	102	172	40.[illegible]	125	[illegible]55	[illegible]3	73	10.1
1942	12.4	[illegible]	[illegible]	[illegible]	2	[illegible]	2.1	4	1	8		7		2	[illegible]0	[illegible]	4.2	78	175	[illegible]	12[illegible]	435	[illegible]0	68	17.0
Michigan																									
1944	11.3	19.8	4[illegible]	1.9	[illegible]	.5	4.[illegible]	2	.4	.9	2.4	4.3	1	.8	35.9	11.0	23.0	72	130	32.2	10[illegible]	3[illegible]6	54	62	23.5
1943	11.2	22.6	45	2.5	1	1	5.4	[illegible]	.4	1.[illegible]	.2	1.6	1	.2	35.1	10.3	12.0	77	124	31.4	102	361	60	56	14.4
1942	10.0	20.1	42	2.3	1	5	2.9	1.1	3	[illegible]1	1	.5	1	.5	34.9	11.1	6.2	61	113	27.5	95	30[illegible]	52	62	25.9
Minnesota																									
1944	12.0	21.9	3[illegible]	1.4	[illegible]	[illegible]	3.2	1.[illegible]	[illegible]	.6	[illegible]7	2.[illegible]		.6	28.[illegible]	6.[illegible]	34.4	80	162	35.8	106	3[illegible]6	39	63	12.9
1943	11.1	23.4	3[illegible]	1.8	[illegible]	[illegible]	1.6	[illegible]	.9	1.4	.3	.8	[illegible]	.8	2[illegible].9	8.2	9.8	6[illegible]	1[illegible]3	30.7	122	335	49	57	7.7
1942	9.9	20.2	31	1.1	2		4.3	.2	.3	.5	.8	.3	.3	.2	24.2	[illegible]	9.0	[illegible]6	142	25.1	102	295	42	62	19.9
Missouri																									
1944	13.6	19.4	38	1.9	.3	.1	2.3	.3	.9	2.5	3.1	4.2	1	.5	50.9	15.4	55.1	110	152	30.8	119	407	117	65	17.0
1943	12.9	23.7	37	1.8	.4	[illegible]	2.8	.9	2.4	.9	1.6	2.8		[illegible]	44.3	14.7	17.3	113	140	29.1	109	387	129	68	12.4
1942	13.4	20.2	41	3.2	.3	.2	2.[illegible]	[illegible]	1.1	1.5	1.[illegible]	.5	.4	[illegible]	46.3	16.[illegible]	19.0	112	157	28.4	119	362	131	75	23.4
Montana																									
1944	13.1	22.[illegible]	42	3.[illegible]	[illegible]	(6)	5.3	[illegible]	4.4	.9	7.9	.9	.9	1.8	42.2	17.6	36.1	69	144	30.1	108	386	56	100	17.6
1943	12.1	23.4	50	1.1	.8	2.5	3.3	1.[illegible]	1.7	3.3	2.5	(6)	[illegible]	[illegible]	46.1	8.4	7.5	70	112	21.8	97	317	61	154	15.9
1942	10.9	20.2	49	3.1	(6)	[illegible]	2.4	[illegible]	2.4	2.4	[illegible]	.8	[illegible]	.8	41.[illegible]	15.0	9.4	58	113	11.0	110	298	58	74	23.6
Nebraska																									
1944	11.7	20.1	30	1.8	.3	[illegible]	2.3	1.3	1.0	2.0	.7	2.3	.7	1.0	21.0	9.[illegible]	61.0	64	123	34.3	117	338	83	74	15.7
1943	11.6	20.1	44	1.5	(6)	(6)	2.0	1.3	1.0	1.0	4.3	1.7	[illegible]	.3	1[illegible].8	7.6	23.1	64	136	38.0	105	348	88	55	9.9
1942	10.0	17.8	37	2.2	[illegible]	.3	1.0	.3	.7	1.0	.5	.3	.3	.7	13.1	9.1	18.6	42	136	29.7	96	291	69	58	14.7
Nevada																									
1944	12.2	20.9	54	2.6	(6)	(6)	[illegible]	[illegible]	(6)		[illegible]	(6)	[illegible]		40.9	24.5	30.0	84	8[illegible]	13.6	104	264	60	193	24.5
1943	12.4	20.9	62	2.7	[illegible]	(6)	[illegible]	[illegible]	[illegible]	.7		2.5	(6)	[illegible]	[illegible]	25.5	5.[illegible]	139	85	14.2	54	311	54	150	34.0
1942	13.[illegible]	16.1	48	(6)	(6)	[illegible]	(6)	[illegible]	[illegible]	9.0		(6)	(6)	3.0	[illegible]6	9.0	9.0	42	119	11.9	96	367	63	275	83.6

New Hampshire																									
1944	14 9	19 0	45	1 9	(6)	(	2 7	1 8	(	2 7	(6)	4 6	9	(	22 8	11 9	50 2	100	160	49 3	144	527	82	70	16 4
New Jersey																									
1944	12 5	17 0	35	1 4	1	(	3 7	2	1	3	5	4 4	1	1 3	38 8	9 7	19 2	64	155	41 2	113	457	81	66	17 0
1943	12 4	20 5	36	1 8	1	2	4 2			9	9	4 3	1	(	43 9	10 9	6 4	63	142	38 6	111	454	79	62	16 9
1942	12 0	17 2	34	1 9	1	3	1 0	3	(	4	1	3	1	(	44 3	8 7	5 9	64	152	41 2	101	419	77	68	24 3
New Mexico																									
1944	11 6	30 4	74	4 2	1 5	2 3	11 3	(	3 8	3 0	3 0	2 5	(	1	51 5	12 8	40 0	86	67	12 8	57	158	60	103	15 8
1943	11 5	29 0	83	6 0	1 5	3 0	11 0	5	1 5	6 1	9 9	8	8	(6	79 7	12 2	20 5	90	87	15 9	43	136	43	147	26 6
1942	10 8	26 6	102	2 6	8	4 6	1	)	2 3	13 8	11	8	( )	8	54 4	13 0	29 9	113	49	7 7	39	156	55	72	33 7
New York																									
1944	13 4	17 5	32	1 9	2	1	2		(			4 6	1	1	1	12 3	11 1	73	178	48 6	99	510	68	53	13 8
1943	13 4	20 6	3	1 8	1	2	5 6		3	1 6		3 1	0	1 6	45 3	16 0	5 5	67	174	47 1	92	507	70	65	12 2
1942	12 3	17 1	34	2 2	1	1	3 1	2	2	4	1	8	1	9	[illegible]	15 7	3 3	57	177	44 7	83	451	66	62	16 9
North Carolina																									
1944	9 3	24 7	51	3 3	2	0	3 6		9	3 4	1 6	2 3	3	2	40	6 5	44 0	78	66	1 7	96	113	92	64	17 1
1943	8	26	48	3 3	1	0	4	7	1 8	3	4	1 7	1	1	41 1	7 1	17 3	69	60	12 7	9	177	77	58	17 4
1942	9 0	24 2	63	3 8	3	8	5	6	1 1	1	3 6	7	1	1	48 0	8 6	17 4	82	58	14 2	89	178	86	70	29 9
North Dakota																									
1944	12 1	26	49	3 6	(6		2 4	2 4	8	8	23 6	3 2	8	1 6	[illegible]	6 3	46 8	71	129	37 3	121	309	63	64	20 6
1943	8 3	26 4	31	2 0	1		2 2	(6	[illegible]		[illegible]	1 5	[illegible]	1	25 9	5 2	9 0	42	94	22 4	88	244	54	40	4 5
1942	8 0	17 9	43	3 1	[illegible]	[illegible]	6 2	[illegible]	(6	2 1	2			1 4	22 9	2 1	6 2	28	83	18 7	78	171	35	27	9 0
Ohio																									
1944	12 9	16 8	46	2 2	4		4 6	1 6	4	1 1	1	4 5	1	6	42 4	12	49	76	142	35 5	129	375	76	70	21 3
1943	12 1	19 5	4	2 0	1	4	2		9	2 1		1 2	1	4	38 9	14 3	18 6	7	138	36 3	12	373	76	75	17 1
1942	12 0	17 6	44	2 3	[illegible]	1	2 7	4		2 8	8	1	1	1	39 7	12 9	16 7	75	13	37 2	113	362	85	83	31 3
Oklahoma																									
1944	10 1	22 3	41	2 6	2	1	2 4	6	1 7	2 5	1 5	8	1 0	(6)	47 7	10 8	50 2	80	91	19 6	97	235	59	73	13 5
1943	9 3	17 7	58	2 7	4	1 1	3 0	2	2 2	3 4	2	3 7	(6	4	40 2	9 5	24 5	69	86	15 1	97	202	57	63	12 3
1942	12 7	28 4	44	3 6	7	1 1	2 2	5	3 8	3 1	12 5	9	1 1	9	59 7	8 2	29 7	90	116	23 1	113	268	75	89	24 4
Oregon																									
1944	11 1	18 9	38	2 1	6	(	9	2 1	6	(6	1 2	3 3	9	(6)	24 2	12 1	31 8	67	130	23 6	107	308	78	81	18 8
Pennsylvania																									
1944	13 1	19 0	42	1 9	2	3	4 5	6	3	8	2 4	3 0	1	0	39 2	10 2	44 0	78	135	39 4	104	431	96	50	11 5
1943	12 8	22 3	40	1 8	4	2	3 6	4	2	2 6	1 1	2 1	3	0	41 2	12 9	14 0	70	131	41 3	107	420	98	54	12 6
1942	12 3	20 9	39	2 0	3	1	3 8	5	3		1 0	3	2	0	40 9	11 0	11 6	61	131	37 7	98	398	98	47	18 1
South Carolina																									
1944	8 1	20 5	60	3 6	4	4	1 1	(6	9	3 4	2 6	1 9	(6)	4	29 0	11 4	42 6	68	50	13 4	80	156	79	65	15 6
1943	7 9	21 5	58	4 2	4	8	2 7	2	1 2	1 9	2	2 7	8	2	34 9	12 5	23 5	70	47	10 8	87	148	86	60	6 9
1942	10 3	23 4	76	5 4	8	1 0	4 6	(6)	3 0	5 0	4 2	1 0	2	(6)	39 8	13 5	34 8	95	57	13 9	103	200	108	71	25 4
South Dakota																									
1944	11 2	25 9	32	1 1	(6	(6)	2 8	7	2 1	1 4	7 8	2 8	(6	7	38 5	7 8	37 7	66	121	19 2	94	321	45	78	19 9
1943	10 5	27 3	34	8	(6	7	2 1	1 4	2 8	2 8	9 1	7	(6	7	33 8	4 4	14 1	68	104	23 2	101	261	56	81	9 8
1942	9 7	20 9	41	1 7	1 4	(6	2 1	(6	6 2	7 6	(6	2 5	( )	(6	26 3	5 5	10 4	69	113	16 6	99	244	65	62	21 4
Tennessee																									
1944	9 8	20 3	49	3 5	1	4	2 3	4	1 1	2 0	4 4	4 5	1	4	69 1	13	58 1	83	80	12 1	92	204	61	59	16 2
1943	9 1	21 7	45	3 7	3	4	2 2	3	1 2	4 4	1 6	2 1	1	4	66 1	12 2	30 3	70	75	11 8	91	180	60	60	13 0
1942	9 7	17 4	64	3 6	4	4	1 7	8	7	2 2	1 9	6	1 0	4	71 6	12 8	32 1	88	73	16 1	86	193	64	65	19 0
Texas																									
1944	9 5	(	(	(	5	2 0	8 8	3	2 1	8	2 4	2 6	5	1	49 2	12 4	52 3	72	77	16 2	72	209	58	76	18 9
1943	9 1	(	(	( )	7	1 9	9 2	3	2 9	4 5	8	1 5	5	2	46 9	12 4	20 2	56	79	14 1	76	222	63	76	16 5
1942	9 3	21 0	49	3 0	9	( )	6 7	4	2 8	2 5	3 0	9	5	2	55 8	(	29 2	66	77	15 2	68	208	64	72	22 9

See footnotes at end of table

Provisional mortality from certain causes in the first 3 months of 1944 with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid and paratyphoid fever (1-2)	Dysentery (27)	Diarrhea and enteritis under 2 years (119)	Scarlet fever (8)	Diphtheria (10)	Whooping cough (9)	Measles (35)	Cerebrospinal (meningococcus) meningitis (6)	Acute poliomyelitis and polioencephalitis (36)	Acute infectious encephalitis (lethargic) (37)	Tuberculosis, all forms (13-22)	Syphilis (30)	Influenza (grippe) (33)	Pneumonia, all forms (107-109)	Cancer, all forms (45-55)	Diabetes mellitus (61)	Intracranial lesions of vascular origin (83)	Diseases of the heart (90-95)	Nephritis, all forms (130-132)	All accidents, including automobile accidents (169-195)	Automobile accidents (170a, b, c)
Vermont																									
1944	13.4	19.4	38	1.3	(6)	(6)	(6)	(6)	(6)	2.6	7.7	3.8	(6)	(6)	30.7	12.8	73.0	76	154	34.6	170	525	79	54	5.1
1943	14.6	20.0	56	2.5	(6)	(6)	(6)	(6)	(6)	5.0	9.9	1.2	(6)	(6)	43.4	5.0	27.3	95	161	31.0	143	442	77	43	6.2
1942	12.8	19.2	41	3.7	(6)	1.2	[illegible]	1.2	1.2	2.4	[illegible]	1.2			36.8	5.9	11.9	55	142	30.9	123	384	89	52	15.4
Virginia																									
1944	10.1	18.4	57	3.1	.1	.5	4.0	.1	.5	4.8	3.3	4.7	.1	.5	43.6	10.7	51.1	71	74	20.4	107	250	84	63	16.9
1943	9.7	20.0	58	3.2	.4	.7	2.0	.7	1.3	3.4	.7	5.7	(6)	.7	48.4	14.0	19.0	79	73	18.6	103	232	77	62	15.6
1942	10.4	17.9	70	3.7	.4	.8	3.6	.5	1.6	4.0	1.3	2.1	.1	.5	53.4	16.9	20.0	86	74	18.4	105	248	86	71	26.0
Wisconsin																									
1944	11.9	19.4	38	1.7	(6)	.1	2.4	1.1	.4	1.4	2.8	2.9	(6)	1.0	29.6	7.1	35.3	73	152	33.9	124	369	70	61	19.1
1943	11.2	21.0	41	2.4	.3	.4	2.3	.5	.5	.8	.5	.9	(6)	.8	25.1	5.8	11.7	60	145	33.3	116	357	66	60	9.4
1942	9.9	17.7	35	2.0	.1	(6)	2.6	1.2	.3	.8	.5	(6)	(6)	.5	24.8	5.2	7.8	49	132	30.5	99	319	57	55	19.9
Wyoming																									
1944	9.8	21.0	35	.8	(6)	1.6	1.6	1.6	4.7	1.6	6.3	3.2	(6)	(6)	15.8	26.9	33.2	52	100	26.9	65	299	63	100	12.6
1943	8.6	19.5	47	2.5	(6)	(6)	(6)	(6)	(6)	1.6	4.8	1.6	1.6	4.8	4.8	14.3	19.1	64	73	14.3	51	236	83	83	15.9
1942	8.3	19.1	48	4.2	(6)	(6)	1.6	1.6	(6)		1.6	1.6	(6)	(6)	14.5	11.5	17.7	50	73	14.5	68	239	65	81	22.6

[1] Estimated population Apr. 1, 1944, 95,883,000. Includes all of the States listed below except Idaho, Minnesota, New Hampshire, New Jersey, Oregon, and Texas. The District of Columbia is included as a State.
[2] These data are taken from the April 1944 Statistical Bulletin published by the Metropolitan Life Insurance Co. The rates for 1943 are subject to correction as they are based on provisional estimates of lives exposed to risk. Data do not include all diseases reported to the Public Health Service.
[3] Classified as diarrhea and enteritis, age not specified.
[4] International List (1940) titles 92, 93 c, d, e, and 95 only.
[5] Chronic nephritis only.
[6] No deaths reported.
[7] Data not available.

INCIDENCE OF HOSPITALIZATION, SEPTEMBER 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	September 1943	September 1944
1. Number of plans supplying data	62	75
2. Number of persons eligible for hospital care	9 886 661	14 876 616
3. Number of persons admitted for hospital care	92 113	124 720
4. Incidence per 1 000 persons, annual rate, during current month (daily rate × 365)	113 4	102 2
5. Incidence per 1 000 persons, annual rate for the 12 months ending Sept 30	105 6	103 7

DEATHS DURING WEEK ENDED OCTOBER 14, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct 14 1944	Corresponding week, 1943
Data from 93 large cities of the United States		
Total deaths	8 412	8 692
Average for 3 prior years	8 272	
Total deaths, first 41 weeks of year	368 221	376 037
Deaths under 1 year of age	654	655
Average for 3 prior years	611	
Deaths under 1 year of age, first 41 weeks of year	25 387	27 226
Data from industrial insurance companies		
Policies in force	66 782 661	65 934 354
Number of death claims	10 054	10 319
Death claims per 1 000 policies in force, annual rate	7 9	8 2
Death claims per 1 000 policies, first 41 weeks of year, annual rate	10 0	9 7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 21, 1944

Summary

The decline in the incidence of poliomyelitis since the peak week (September 2) has been somewhat less rapid than the rise preceding the peak. A slight break occurred during the current week in the downward trend of the past 6 weeks. A total of 721 cases was reported for the week—10 more than for the preceding week, and more than twice the median for the corresponding weeks of the past 5 years. Decreases were recorded only in the North Central and East South Central geographic divisions. Increases were reported in 10 of the 14 States reporting more than 13 cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 32 (27), New York 259 (234), Michigan 23 (22), Wisconsin 15 (13), Minnesota 26 (25), Maryland 19 (16), Virginia 28 (21), West Virginia 15 (14), North Carolina 20 (10), California 15 (10); *decreases*—Pennsylvania 48 (60), Ohio 49 (60), Illinois 19 (36); *no change*—New Jersey 26 (26).

The total for the year to date is 16,856, as compared with 10,757 and 14,164 for the corresponding periods of last year and 1931, respectively, or approximately 86 percent and 90 percent of the respective totals reported for those years, the two prior years of highest incidence since 1916.

For the fourth consecutive week the incidence of meningococcus meningitis increased. A total of 175 cases for the week brings the total for the year to date to 14,329, as compared with a 5-year median of 1,673 and 15,178 for the corresponding period last year.

The incidence of scarlet fever increased during the week from 1,565 to 2,041. The 5-year median, however, is 2,089, and for the corresponding week last year the figure was 2,510. The current week's total of influenza cases, 1,277, while slightly above the median, is below the total for the week last year. While showing slight increases, the current reports of diphtheria, typhoid fever, and whooping cough are below the corresponding 5-year medians.

A total of 8,982 deaths was recorded in 92 large cities of the United States, as compared with 8,347 last week and a 3-year (1941–43) average of 8,371. The cumulative total to date is 375,295, as compared with 382,837 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Oct. 28, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria, Week ended—Oct. 28, 1944	Diphtheria, Oct. 30, 1943	Diphtheria, Median 1939–43	Influenza, Week ended—Oct. 28, 1944	Influenza, Oct. 30, 1943	Influenza, Median 1939–43	Measles, Week ended—Oct. 28, 1944	Measles, Oct. 30, 1943	Measles, Median 1939–43	Meningitis, meningococcus, Week ended—Oct. 28, 1944	Meningitis, meningococcus, Oct. 30, 1943	Meningitis, meningococcus, Median 1939–43
NEW ENGLAND												
Maine	0	1	0				1	42	31	0	4	1
New Hampshire	0	0	0				32	1	1	0	1	0
Vermont	0	0	0				1	20	10	0	1	0
Massachusetts	[illegible]		[illegible]				70	[illegible]	[illegible]	3	[illegible]	2
Rhode Island	2	0	1	1			0	23	3	1	8	1
Connecticut	0	0	0	1		1	12	6	6	[illegible]	4	0
MIDDLE ATLANTIC												
New York	10	8	1	[illegible]	[illegible]	[illegible]	1	12	1	3	38	2
New Jersey	1	1		1		[illegible]	5	1	21	16	12	0
Pennsylvania	[illegible]	[illegible]	11	[illegible]			[illegible]	[illegible]	105	12	1	6
EAST NORTH CENTRAL												
Ohio	8	6	21	8	1	3	6	[illegible]		[illegible]	12	1
Indiana	12	[illegible]	11		3	3	4	[illegible]	8	2	6	0
Illinois	6	7	18	[illegible]	6	6	1	1	1	11	8	3
Michigan	[illegible]	12	16				1			10	12	0
Wisconsin	0	1	[illegible]		[illegible]	16	11	[illegible]	1		2	[illegible]
WEST NORTH CENTRAL												
Minnesota	18	10	4	1	1	1	1	25	10	3	4	0
Iowa	1	1	2			1	4	6	12	0	0	0
Missouri	2	1	10	1	2		1	4	1	8	7	0
North Dakota	1	4	1		2	2	0	1	1	1	1	0
South Dakota	1	9	7				3	[illegible]	1	0	0	0
Nebraska	0	0	1		1			3	4	2	0	0
Kansas	0	4	4	[illegible]	1	2	1	6	6	3	0	0
SOUTH ATLANTIC												
Delaware	0	0	1				0	3	0	1	1	0
Maryland		6	6		2	2	6		1	2	7	3
District of Columbia	0	0	2	1			3	1	1	0	4	0
Virginia	17	22	33	103	15	101	3	78	20	2	10	1
West Virginia	3	9	[illegible]	3		10	1	18	3	1	3	1
North Carolina	[illegible]	29	[illegible]		4	[illegible]	3	1	1	1	6	0
South Carolina	30	28	32	[illegible]	303	[illegible]	[illegible]	2	3	2	[illegible]	0
Georgia	17	30	30	29	11	22	2	6	1	3	1	1
Florida	10	7	8		10	3	0	4	4	1	0	0
EAST SOUTH CENTRAL												
Kentucky	3	16	16			3	2	[illegible]	13	2	4	1
Tennessee	14	2	2	7	11	11	4	6	7	3	7	1
Alabama	25	32	[illegible]	20	[illegible]	[illegible]	2		3	3		1
Mississippi	23	7	16							3	1	1
WEST SOUTH CENTRAL												
Arkansas	1	11	1	20	22	18	4	8		0	0	0
Louisiana	17	4	[illegible]			2	0	1	1	0	2	0
Oklahoma	18	6	[illegible]	41	12	[illegible]	1	1		1	4	0
Texas	8	[illegible]	[illegible]	[illegible]	[illegible]	114	21	3	1	1	3	1
MOUNTAIN												
Montana	2	0	1	3		2	4		13	1	0	0
Idaho	0	1	0				3	1	1	0	0	0
Wyoming	1	0	0	6	2	2	0			0	1	0
Colorado	8	4	9	7	10	10	6	11	[illegible]	0	6	0
New Mexico	14	0	0		1	1	2		[illegible]	0	1	0
Arizona	0	1	2	[illegible]	[illegible]	[illegible]	3	0	[illegible]	0	1	0
Utah [2]	0	0	0	2		3	10	1	1	1	0	0
Nevada	0	0	0				0	3	6	0	0	0
PACIFIC												
Washington	19	14	5				12	[illegible]	22	3	2	1
Oregon	0	1	1	7	11	11	34	[illegible]	15	1	5	0
California	21	36	22	18	13	18	147	45	48	0	12	2
Total	452	438	656	1 277	1 447	1 131	513	2 096	1 201	175	224	37
42 weeks	9 697	10 303	11 359	346 018	89 808	156 030	[illegible] 404	[illegible] 387	[illegible]	14 329	15 178	1 673

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended Oct 21, 1944, and comparison with corresponding week of of 1943 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Oct 21 1944	*Oct 23 1943*		*Oct 21 1944*	*Oct 23 1943*		*Oct 21 1944*	*Oct 23 1943*		*Oct 21 1944*	*Oct 23 1943*	
NEW ENGLAND												
Maine	0	0	0	27	22	11	0	0	0	0	2	0
New Hampshire	2	1	1	9	4	6	0	0		0	0	0
Vermont	4	3	1	11	6	4	0	0	0	0	1	0
Massachusetts	32	17	4	119	163	94	0	0	0	4	[illegible]	2
Rhode Island	1	4	1	8	7	4	0	0	0	0	0	0
Connecticut	12	8	1	22	33	23	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	[illegible]	39	39	131	191	123	0	0	0	[illegible]	11	11
New Jersey	26	0	9	34	97	[illegible]	0	0	0	1	[illegible]	3
Pennsylvania	48	7	7	112	[illegible]	122	0	0	0	9	2	10
EAST NORTH CENTRAL												
Ohio	49	13	13	125	266	156	1	0	0	3	10	10
Indiana	7	5	4	38	78	78	1	0	0	0	0	4
Illinois	19	57	20	131	97	148	0	0	1	2	[illegible]	[illegible]
Michigan [2]	23	11	11	101	126	126	0	0	0	3	3	3
Wisconsin	15	16	7	36	114	97	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	26	7	11	39	74	57	0	0	0	0	0	0
Iowa	13	4	4	31	[illegible]	[illegible]	0	0	0	1	0	3
Missouri	13	1	1	33	39	56	0	0	1	3	1	3
North Dakota	0	1	1	9	10	10	0	0	0	0	2	2
South Dakota	0	1	1	4	10	12	0	0	0	0	0	0
Nebraska	3	2	2	33	11	11	0	0	1	1	0	0
Kansas	1	22	8	69	77	62	0	0	0	0	2	3
SOUTH ATLANTIC												
Delaware	3	0	0	3	5	[illegible]	0	0	0	1	0	1
Maryland	19	0	1	51	2	[illegible]	0	0	0	2	1	[illegible]
District of Columbia	9	0	0	9	[illegible]	14	0	0	0	0	0	0
Virginia	28	2	2	63	42	42	0	0	0	4	[illegible]	8
West Virginia	15	1	3	[illegible]	104	[illegible]	0	0	0	2	1	7
North Carolina	20	0	5	70	[illegible]	93	0	0	0	2	1	5
South Carolina	1	0	0	10	13	13	0	0	0	3	0	3
Georgia	6	2	1	24	33	[illegible]	0	1	0	3	4	6
Florida	1	1	1	10	1	[illegible]	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	11	3	5	19	[illegible]	48	0	0	0	4	0	10
Tennessee	2	0	1	81	[illegible]	[illegible]	0	0	0	4	3	11
Alabama	0	0	2	30	24	47	1	0	0	0	1	[illegible]
Mississippi [2]	1	0	0	15	8	14	0	0	0	7	1	2
WEST SOUTH CENTRAL												
Arkansas	1	2	2	17	7	12	0	0	0	5	1	8
Louisiana	3	1	1	[illegible]	9	8	0	0	0	3	4	5
Oklahoma	2	9	2	21	8	20	0	0	0	1	4	5
Texas	3	16	11	[illegible]	47	40	0	0	0	14	[illegible]	[illegible]
MOUNTAIN												
Montana	1	0	0	8	20	14	1	0	0	0	0	1
Idaho	2	0	0	31	7	7	0	0	0	2	0	0
Wyoming	0	5	1	3	4	4	0	0	0	0	0	0
Colorado	0	17	6	38	14	22	1	0	0	2	4	3
New Mexico	3	3	2	13	8	[illegible]	0	0	0	3	10	6
Arizona	2	0	0	8	10	2	0	0	0	2	0	0
Utah [2]	0	13	2	10	14	9	0	0	0	0	1	0
Nevada	0	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	10	24	2	46	67	25	0	0	0	2	1	2
Oregon	11	36	4	18	28	13	0	0	0	1	1	1
California	15	84	19	157	116	89	0	0	0	5	9	9
Total	722	438	334	2 041	2 510	2 089	5	1	15	107	121	227
42 weeks	16 856	10 757	7 591	158 104	111 119	111 119	329	645	1 230	4 685	4 739	7 241

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever cases reported separately as follows Massachusetts 3 New York, 1 Michigan, 1 Iowa, 1, Florida, 1, Texas, 3, California 2

Telegraphic morbidity reports from State health officers for the week ended Oct 21, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough, Week ended— Oct 21 1944	Whooping cough, Week ended— Oct 23 1943	Whooping cough, Median 1939–43	Week ended October 21, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	4	12	12	0	0	0	0	0	0	0	0	0
New Hampshire	0	12	1	0	0	0	0	0	0	0	0	0
Vermont	19	27	27	0	0	0	0	0	0	0	0	0
Massachusetts	88	78	94	0	0	6	0	0	0	0	0	0
Rhode Island	8	31	19	0	0	0	0	0	0	0	0	0
Connecticut	56	37	55	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	177	234	287	0	2	129	0	2	0	0	0	0
New Jersey	14	104	123	0	0	0	0	0	0	0	0	0
Pennsylvania	76	126	297	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	92	143	16[illegible]	0	0	0	0	0	0	0	0	0
Indiana	12	19	19	0	0	0	0	0	0	0	0	0
Illinois	83	105	149	0	9	11	0	0	0	0	0	0
Michigan [3]	49	212	231	0	0	9	0	0	0	0	0	0
Wisconsin	64	167	161	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	38	42	0	4	0	0	0	0	0	0	0
Iowa	[illegible]	35	16	0	0	0	0	0	0	0	0	0
Missouri	12	14	14	0	0	0	8	0	0	0	1	0
North Dakota	3	11	11	0	0	0	0	1	0	0	0	0
South Dakota	2	2	2	0	0	0	0	0	0	0	0	0
Nebraska	4	13	[illegible]	0	0	0	0	0	0	0	0	0
Kansas	13	33	33	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	2	0	3	0	0	0	0	0	0	0	0	0
Maryland [2]	16	41	44	0	0	0	[illegible]	0	0	0	0	0
District of Columbia	10	2	4	0	0	0	0	0	0	0	0	0
Virginia	6	106	31	0	0	0	162	0	0	0	1	1
West Virginia	14	22	22	0	0	0	0	0	0	0	0	0
North Carolina	48	113	99	0	0	0	0	0	0	0	0	3
South Carolina	2[illegible]	50	2[illegible]	0	0	18	0	0	0	0	0	3
Georgia	0	11	18	0	2	7	0	0	0	0	0	24
Florida	4	1[illegible]	6	0	2	0	0	1	0	0	0	2
EAST SOUTH CENTRAL												
Kentucky	12	47	40	0	0	0	0	0	0	0	0	0
Tennessee	11	32	32	0	1	0	2	0	0	1	0	2
Alabama	10	1[illegible]	16	0	0	0	0	0	0	0	0	17
Mississippi				0	0	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	3	18	18	0	1	15	0	0	0	0	0	0
Louisiana	2	0	3	0	1	0	0	0	0	0	0	3
Oklahoma	4	2	7	0	0	0	7	0	0	0	0	0
Texas	150	97	97	0	33	620	28	1	1	0	3	30
MOUNTAIN												
Montana	17	14	14	0	0	0	0	0	0	0	0	0
Idaho	1	9	4	0	0	0	0	0	0	0	0	0
Wyoming	13	4	3	0	0	0	0	0	0	0	0	0
Colorado	12	50	19	0	0	0	0	0	0	0	0	0
New Mexico	2	[illegible]	17	0	0	3	3	0	0	0	0	0
Arizona	20	7	7	0	0	0	16	0	0	0	0	0
Utah [2]	7	23	23	0	0	0	0	0	0	0	0	0
Nevada	0	11	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	[illegible]	47	43	0	0	0	0	0	0	0	0	0
Oregon	7	1[illegible]	13	0	0	0	0	0	0	0	0	0
California	88	110	181	0	0	16	0	3	0	0	0	1
Total	1 407	2,329	2,780	0	55	835	226	9	1	1	5	87
Same week 1943				2	39	209	124	17	1	1	4	130
Same week 1942				0	29	281	101	9	1	1	4	123
42 weeks 1944	77 889			37	1 484	19 126	7,493	552	25	440	464	4 131
42 weeks 1943	154 651			53	1 746	13 705	6 591	586	23	420	681	3 479
42 weeks 1942	147 130		[4] 147 861	68	997	10 632	5 830	466	39	[4] 441	741	[4] 2 309

[2] Period ended earlier than Saturday

[4] 5 year median 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct 14, 1944

This table lists the reports from 86 cities of more than 10 000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis infectious cases	Influenza		Measles cases	Meningitis meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	1		0	0	1	1	1	3	0	0	1
New Hampshire												
Concord	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	0	0		1	3	2	1[illegible]	10	30	0	0	13
Fall River	0	0		0	0	0	0	0	0	0	0	1
Springfield	0	0		0	0	0	0	3	11	0	1	1
Worcester	0	0		0	0	0	9	2	1	0	0	3
Rhode Island												
Providence	0	0	1	0	0	0	1	0	3	0	0	13
Connecticut												
Bridgeport	0	0		0	0	1	0	0	2	0	0	0
Hartford	0	0		0	0	0	0	0	[illegible]	0	0	0
New Haven	0	0	1	0	0	1	1	0	1	0	0	12
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	0		10	1	0	1	1
New York	0	0	[illegible]	1	10	11	41	88	[illegible]	0	3	72
Rochester	0	0		0	4	1	4	1[illegible]	1	0	0	7
Syracuse	0	0		0	0	0	2	2	0	0	0	10
New Jersey												
Camden	2	0		0	0	0		1	1	0	0	0
Newark	0	0		0	1	0		1	4	0	[illegible]	4
Trenton	0	0		0	0	0	3	4	1	0	0	0
Pennsylvania												
Philadelphia	3	1	2	2	3	1	18	11	21	0	2	18
Pittsburgh	0	0		0	0		9	4	[illegible]	0	0	3
Reading	0	0		0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	0	0		0	1	3	0	10	1[illegible]	0	0	1
Cleveland	0	0	2	1	1	3	11	10	1[illegible]	0	0	21
Columbus	0	0	1	1	0	0	4	1		0	0	11
Indiana												
Fort Wayne	0	0		0	0	0	0	0	3	0	0	0
Indianapolis	[illegible]	0		0	1	0	[illegible]	0	4	0	0	
Terre Haute	0	0		0	1	0	1	0	1	0	0	0
Illinois												
Chicago	1	0	1	1	11	1[illegible]	19	1	23	0	0	29
Springfield	0	0		0	[illegible]	0	0	1	2	0	0	0
Michigan												
Detroit	7	[illegible]		1	3	1	11		18	0	0	2[illegible]
Flint	1	0		0	0	0	3	0	5	0	0	4
Grand Rapids	0	0		0	0	0	1	0	6	0	0	0
Wisconsin												
Kenosha	0	0		0	0	0	0	0	1	0	0	5
Milwaukee	0	0		0		1	7	0	6	0	0	15
Racine	0	0		0	0	0	0	0	1	0	0	2
Superior	0	0		0	0	0	0	0	3	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	0	0	1	4	1	0	0	2
Minneapolis	16	0		0	2	3	2	7	6	0	0	3
St Paul	0	0		0	0	2	3	2	2	0	0	19
Missouri												
Kansas City	2	0		2	0	3	7	0	3	0	0	1
St Joseph	0	0		0	0	0	0	0	4	0	0	0
St Louis	0	0	1	0	0	3	8	10	2	0	0	4
Nebraska												
Omaha	1	0		0	1	0	2	0	3	0	0	0

City reports for week ended Oct. 14, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Kansas:												
Topeka	0	0		0	[illegible]	0	0	0	2	0	0	[illegible]
Wichita	0	0		0	4	0	1	0	3	0	0	[illegible]
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	3	2	0	0	0	[illegible]
Maryland:												
Baltimore	[illegible]	1	1	1	1	2	9	4	10	[illegible]	0	6
Cumberland	0	0		0	0	0	0	0	0	0	0	[illegible]
Frederick	0	0		0	0	0	0	0	0	0	0	[illegible]
District of Columbia:												
Washington	0	0		0	0	1	[illegible]	13	4	0	0	[illegible]
Virginia:												
Lynchburg	0	0		0	0	0	0	7	2	0	1	[illegible]
Richmond	2	0		0	1	1	0	[illegible]	[illegible]	0	0	[illegible]
Roanoke	1	0		0	0	0	1	0	0	0	0	[illegible]
West Virginia:												
Charleston	0	0		0	0	0	0	0	1	0	0	
Wheeling	0	0		0	0	0	2	1	1	0	0	[illegible]
North Carolina:												
Raleigh	0	0		0	0	0	0	0	0	0	0	
Wilmington	[illegible]	0		0	[illegible]	0	0	0	2	0	0	
Winston-Salem	0	0		0	0	0	0	0	6	0	0	
South Carolina:												
Charleston	0	0		0	0	1	1	0	0	0	0	
Georgia:												
Atlanta	0	0	8	0	0	0	2	0	4	0	0	
Savannah	0	0		0	0	0	2	0	0	0	0	
Florida:												
Tampa	1	0		0	0	0	2	0	1	0	0	
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	2	0		0	0	0	9	0	1	0	0	
Nashville	0	0		0	0	0	4	0	[illegible]	0	0	
Alabama:												
Birmingham	0	0		0	0	0		0	3	0	0	
Mobile	4	0		0	0	0	1	[illegible]	0	0	[illegible]	
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0		0	0	0	0	1	0	0	0	
Louisiana:												
New Orleans	2	0	1	1	1	0	3	1	[illegible]	0	1	
Shreveport	[illegible]	0		0	0	0	0	0	0	0	2	
Texas:												
Dallas	8	0	1	1	0	0	3	0	1	0	0	
Galveston	0	0		0	0	0	2	0	0	0	0	
Houston	1	0		0	0	1	2	0	4	0	0	
San Antonio	1	0		0	0	0	0	1	1	0	0	
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	3	0	0	0	0	
Great Falls	0	0		0	0	0	0	0	2	0	0	
Helena	0	0		0	0	0	0	0	1	0	0	
Missoula	0	0		0	0	0	0	0	0	0	0	
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	
Colorado:												
Denver	2	0	3	1	6	1	11	1	7	0	0	
Pueblo	0	0		0	0	0	1	0	2	0	0	
Utah:												
Salt Lake City	0	0		0	1	0	2	0	4	0	0	
PACIFIC												
Washington:												
Seattle	1	0		0	0	1	1	0	5	0	0	
Spokane	0	0		0	3	0	0	1	1	0	0	
Tacoma	0	0		1	0	0	2	0	3	0	0	

City reports for week ended Oct. 14, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC—continued												
California												
Los Angeles	4	0	5	1	6	2	3	1	30	0	0	6
Sacramento	1	3		0	3	1	0	1	4	0	0	4
San Francisco	0	0		0	10	2	5	2	5	0	1	1
Total	89	12	30	16	140	69	296	259	419	0	12	416
Corresponding week, 1943	65		36	17	345		285		620	0	20	759
Average 1939 43	81		57	[1] 15	[2] 254	-	[1] 290		464	0	30	933

[1] 3 year average 1941–43
[2] 5 year median 1939 43

Anthrax.—Cases New York 1 Philadelphia, 1
Dysentery amebic.—Cases Boston, 2, Buffalo, 1 New York, 1 Chicago, 4, Atlanta 1 Los Angeles 1
Dysentery bacillary.—Cases Buffalo, 88 New York, 14 Rochester 1, Syracuse, 2 Chicago, 2, Detroit, 7, St Paul, 5 St Louis 1 Charleston S C 5 Atlanta, 3, Los Angeles, 6 San Francisco, 1
Dysentery, unspecified.—Cases Richmond 1
Leprosy.—Cases New Orleans, 1
Tularemia.—Cases Missoula 1
Typhus fever endemic.—Cases Wilmington N C, 1 Charleston, S C, 1 Atlanta, 1 Savannah, 2 Tampa, 1, Nashville, 1, Birmingham, 2, Mobile, 5 New Orleans, 2, Houston, 6 San Antonio, 3

Rates (annual basis) per 100,000 population, by geographic groups, for the 86 cities in the preceding table (estimated population, 1943, 34,221,000)

	Diphtheria case rates	Encephalitis infectious case rates	Influenza		Measles case rates	Meningitis meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates		mallpox	phoid phoic ite	
			Case rates	Death rates								
New England	0 0	2 6	5 3	2 6	139	13 1	63 0	42 0	184	0 0	2 6	116
Middle Atlantic	6 5	0 5	1 9	1 4	8	7 4	41 7	14 3	44	0 0	2 8	53
East North Central	6 8	3 7	2 5	2 5	15	14 8	44 3	21 6		0 0	0 0	75
West North Central	38 2	0 0	2 0	4 0	21	22 1	48 3	46 3	52	0 0	0 0	62
South Atlantic	26 4	1 6	14 8	1 6	3	8 2	47 8	52 8	61	0 0	1 6	124
East South Central	35 4	0 0		0 0	0	0 0	112 1	0 0	35	0 0	0 0	18
West South Central	43 0	0 0	5 7	5 7	3	2 9	28 7	8 6	32	0 0	8 6	6
Mountain	15 9	0 0	23 8	7 9	56	7 9	135 0	7 9	127	0 0	0 0	79
Pacific	9 5	4 7	7 9	3 2	35	9 5	17 4	7 9	76	0 0	1 6	22
Total	13 6	1 8	4 6	2 4	21	10 5	45 2	33 6	61	0 0	1	

PLAGUE INFECTION IN TACOMA, WASH.

Under date of October 18, 1944, plague infection, first reported on October 16, was reported confirmed in two specimen fleas taken on the water front at Tacoma, Wash.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found on September 19, 1944, in Honokaa, Paauhua area, Hamakua District, Island of Hawaii, T. H., was proved positive for plague on September 25, 1944.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 30, 1944.—During the week ended September 30, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		55		34	72	9	2	17	57	246
Diphtheria		6	5	19		4	2			36
Dysentery, bacillary				9		3				12
Encephalitis, infectious						1				1
German measles				4	7	1	2	1	14	29
Influenza					29			1	5	35
Measles	1		5	38	20	11	6	3	32	116
Meningitis, meningococcus		1			3	1				5
Mumps				47	26	4	3	6	22	108
Poliomyelitis		2	3	7	14	4	1	6	2	39
Scarlet fever	2	3	4	44	66	15		13	17	164
Tuberculosis (all forms)		1	6	188	36	18		24	25	298
Typhoid and paratyphoid fever		1		20	6	1	1		2	31
Undulant fever				1						1
Venereal diseases										
Gonorrhea		38	33		98		24	19	70	305
Syphilis	4	13	24		74	15	9	8	20	167
Whooping cough		19		89	42	14	10	31	17	222

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

British East Africa—Kenya.—For the week ended September 23, 1944, 5 cases of plague with 1 death were reported in Kenya, British East Africa.

French West Africa—Dakar.—For the week ended October 7, 1944, 19 cases of plague with 15 deaths were reported in Dakar, French West Africa.

Palestine.—For the week ended September 30, 1944, 5 cases of plague were reported in Haifa and Jaffa, Palestine.

Portugal—Azores—Angra do Heroismo.—For the week ended October 14, 1944, 3 cases of plague were reported in Angra do Heroismo, Azores, Portugal.

Senegal—Thies.—For the period September 11-20, 1944, 8 cases of plague with 7 deaths were reported in Thies, Senegal.

Tunisia—Tunis.—For the week ended October 21, 1944, 1 fatal case of plague was reported in Tunis, Tunisia.

Smallpox

French Guinea.—For the period September 11 20, 1944, 73 cases of smallpox with 4 deaths were reported in French Guinea.

Union of South Africa —For the month of July 1944, 217 cases of smallpox with 35 deaths were reported in the whole Union of South Africa

Venezuela.—For the month of September 1944, 54 cases of smallpox (including 51 cases in Caracas and vicinity) were reported in Venezuela.

Typhus Fever

Algeria.—For the period September 1-10, 1944, 18 cases of typhus fever were reported in Algeria.

Egypt.—For the week ended September 16, 1944, 46 cases of typhus fever with 7 deaths were reported in Egypt.

French West Africa—Dakar.—For the month of August 1944, 16 cases of typhus fever were reported in Dakar, French West Africa.

Tunisia.—Typhus fever has been reported in Tunisia as follows: September 11-20, 1944, 50 cases; September 21-30, 1944, 10 cases.

Union of South Africa.—Typhus fever has been reported in the Union of South Africa as follows. May 1944, 492 cases, 182 deaths; June 1944, 395 cases, 119 deaths; July 1944, 160 cases, 11 deaths. These figures are for the entire Union of South Africa. For the month of August 1944, 283 cases of typhus fever with 13 deaths were reported in Cape Province, practically all from the eastern half of the Province.

Venezuela.—For the month of September 1944, 10 cases of typhus fever with 1 death were reported in Venezuela, including 5 cases in Araguay State, 2 cases in Lara State, and 2 cases in Zulia State.

Yellow Fever

French Guinea—Kindia (vicinity of).—On October 6, 1944, 1 fatal case of suspected yellow fever was reported in the vicinity of Kindia, French Guinea.

Gold Coast.—On September 28, 1944, 1 fatal case of yellow fever was reported in Gold Coast, no location being given.

×

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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A Report on Influenza Surveys, 1918–44

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Public Health Reports

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AGE AND SEX INCIDENCE OF INFLUENZA IN THE EPIDEMIC OF 1943–44, WITH COMPARATIVE DATA FOR PRECEDING OUTBREAKS [1]

Based on surveys in Baltimore and other communities in the Eastern States

By SELWYN D. COLLINS, *Head Statistician, United States Public Health Service*

Monthly influenza-pneumonia death rates in Massachusetts (*14*) show a series of moderate-sized epidemics of those diseases from 1890 to 1900, followed by several smaller outbreaks from 1901 to 1907. Then came almost a decade in which there was practically no excess mortality over the usual seasonal expectancy, but minor epidemics occurred in the early months of 1916, 1917, and 1918. Since September of 1918 weekly mortality from influenza and pneumonia in groups of cities is available (*3*, *4*, *6*, *15*). Counting minor and major epidemics, the current influenza outbreak of December-January 1943–44 was the twentieth period since the beginning of 1916 in which influenza and pneumonia mortality was above the usual seasonal expectancy in nearly all geographic sections of the United States. In practically every instance the excess in mortality extended over a period of 2 to 4 months, with a mortality peak which marked the phenomenon with the usual characteristics of an influenza outbreak.

The recent accelerated decrease in the mortality from pneumonia and influenza which began about 1938 (*15*) is presumably due to newer methods of treatment. Improved treatment would reduce the mortality but would affect the number of cases of pneumonia only insofar as these drugs are used in influenza to prevent the occurrence of complications and presumably would have no effect upon the number of influenza cases. The mortality from influenza and pneumonia in excess of the usual seasonal expectancy has been used as a measure of the extent and severity of influenza epidemics because the reporting of cases is so incomplete; however, in the last few years of greatly

[1] Received for publication April 11, 1944, from the Division of Public Health Methods. Few of the data included in this paper have been published in the form and detail in which they appear here, however, various papers have described the nature and scope of the several projects involved, and references to such papers are made in footnotes to the tables and elsewhere. The 1920 Baltimore data were collected under the supervision of W. H. Frost and Edgar Sydenstricker, but the only published results are those pertaining to immunity which were included in Jordan's treatise (*16*, pp. 207–208). The 1943–44 data as well as those for the outbreaks of 1939–40 and 1940–41 were collected under the supervision of Associate Statistician F. Ruth Phillips, with the cooperation and assistance of the Milbank Memorial Fund, the Johns Hopkins School of Hygiene, and the Baltimore City Health Department.

reduced case fatality the smaller epidemics may mean fewer deaths but not necessarily fewer cases.

About the time of and following the 1918 influenza epidemic there was a tendency to attribute the disease to the Pfeiffer or influenza bacillus. After much work on various organisms found in the nose and throat of influenza patients, the affection has been classified as a virus disease and two or more specific viruses have been identified (*13*, *21*). At least one of those viruses (A virus) has been identified in interepidemic cases as well as those occurring during an epidemic (*23*). Virus A has been identified in cases occurring during the current 1943–44 epidemic (*23*, *30*) and also in the outbreaks of 1932–33, 1934–35, 1936–37, 1938–39, and 1940–41, although B virus was also found in the 1938–39 epidemic (*13*). On the other hand, the epidemics of 1935–36 and 1939–40 have been attributed to B virus. Both viruses have been found in the same epidemic and occasionally in the same patient (*13*); in all epidemics tests in many cases have failed to identify either A or B virus (*21*). There appears to be no way to tell whether the disease which has been called influenza or grippe in the numerous epidemics preceding the work on influenza viruses was etiologically the same or different in the several epidemics

While a specific infectious disease usually displays a characteristic age curve, this is not invariably true (*18*, *20*, *29*). The age curves of some of the acute communicable diseases vary under certain circumstances (*10*, *11*); in areas where measles has not occurred for many years, this childhood affection freely attacks persons of all ages (*8*, *19*, *24*). While variation in the epidemiological characteristics of what has been recorded as influenza or grippe may have little relation to etiology, it seems worth while to compare the several respiratory outbreaks with respect to different attributes, including age and sex incidence.

There are few data on officially reported cases of influenza prior to or during the great pandemic of the fall of 1918. Since 1920 the disease has been reportable in nearly all of the States, but reporting has been extremely incomplete Because of the absence of case data, the United States Public Health Service undertook in 1918 to collect, by house-to-house canvass immediately after the epidemic, some data on the incidence of influenza and pneumonia with special reference to age and sex variations (*2*, *12*). In 12 of the 18 epidemics since the beginning of 1918, data for one or more localities have been collected by house-to-house canvasses immediately after the outbreak or by periodic canvasses or reports in studies that were under way at the time that the epidemic occurred In 6 of the outbreaks the data pertain to surveyed groups in Baltimore, Md. (table 1); in 2 others to Hagerstown, Md. (table 2); and in the other epidemics except 1, they are for other communities in the eastern part of the United States (tables 4 and

TABLE 1.—*Age and sex incidence of certain respiratory diseases in canvassed families during five epidemics,[1] 1918–44*

BALTIMORE, MD.

Age	Case rate per 1,000 population: Total influenza, grippe, pneumonia, and colds in bed[2]: Both sexes	Male	Female	Influenza and grippe: Both sexes	Male	Female	Pneumonia[3]: Both sexes	Male	Female	Percent of total cases complicated by pneumonia: Both sexes	Male	Female	Number of persons canvassed: Male	Female
Epidemic of 1918–19 (September 1918–January 1919)														
All ages[4]	246	236	254	195.8	189.6	201.2	18.0	17.5	18.4	7.3	7.4	7.2	15,440	17,921
Under 5	283	285	281	214.8	220.6	208.2	29.4	32.3	26.5	10.4	11.3	9.4	1,642	1,585
5–9	366	369	364	315.9	318.7	313.2	14.7	14.0	15.5	4.0	3.8	4.2	1,500	1,488
10–14	317	310	325	265.0	257.5	272.2	12.4	10.2	14.5	3.9	3.3	4.5	1,375	1,451
15–19	289	257	317	235.2	213.2	254.1	19.5	18.4	20.5	6.8	7.2	6.5	1,304	1,511
20–24	275	234	297	219.7	179.4	241.3	23.3	21.9	24.0	8.5	9.4	8.1	959	1,790
25–29	314	301	322	252.7	241.7	260.1	32.2	40.4	26.7	10.3	13.4	8.3	1,138	1,688
30–34	295	295	294	230.6	234.9	227.0	24.3	24.6	24.0	8.3	8.3	8.2	1,260	1,498
35–39	229	217	241	182.4	174.8	189.8	20.4	20.7	20.2	8.9	9.5	8.4	1,207	1,238
40–44	185	186	184	144.4	150.0	139.1	11.2	11.0	11.4	6.1	5.9	6.2	1,000	1,057
45–49	158	135	180	122.9	103.1	141.5	6.4	4.4	8.3	4.0	3.3	4.6	912	968
50–59	134	123	143	101.0	99.0	102.9	7.4	4.7	9.9	5.5	3.8	6.9	1,283	1,419
60 and over	101	103	100	66.0	69.2	63.3	12.4	9.1	15.1	12.2	8.9	15.0	1,098	1,327
Cases, all ages	8,199	3,640	4,559	6,533	2,928	3,605	599	270	329					
Epidemic of 1919–20 (December 1919–March 1920)														
All ages[4]	89	78	100	47.4	40.2	53.8	5.9	5.8	6.0	6.[illegible]	7.4	6.1	15,275	17,200
Under 5	86	86	86	35.2	34.8	35.6	7.7	11.2	4.2	8.9	13.0	4.9	1,435	1,433
5–9	92	91	93	45.8	41.3	50.0	7.3	8.5	[illegible].1	7.9	9.4	6.5	1,404	1,480
10–14	67	60	74	32.2	29.0	35.1	2.2	3.1	.4	3.2	5.7	2.8	1,310	1,456
15–19	65	61	69	35.6	34.0	37.0	3.2	3.9	2.6	4.9			1,295	1,514
20–24	81	61	97	45.7	32.3	56.6	4.[illegible]	3.1	5.7	5.7	7.6	6.5	1,274	1,573
25–29	104	81	126	61.6	45.1	76.3	8.1	7.5	8.7	7.8			1,331	1,496
30–34	123	105	138	71.9	60.8	81.5	7.6	6.6	9.3	6.2	7.0	7.1	1,218	1,424
35–39	106	85	125	58.4	44.9	70.4	8.6			8.1			1,203	1,365
40–44	89	71	105	42.9	37.2	48.3	4.8	3.7	5.0	5.4	4.6	4.7	997	1,076
45–49	99	91	106	52.6	43.8	61.1	3.8			3.9			891	932
50–59	101	95	106	51.2	49.2	52.9	7.4	5.0	7.6	7.3	6.3	7.8	1,319	1,531
60 and over	77	62	88	43.2	36.2	48.9	5.4			7.0			1,079	1,349
Cases, all ages	2,899	1,189	1,710	1,539	614	925	192	88	104					
Epidemic of 1928–29 (Dec. 1, 1928–Feb. 19, 1929)														
All ages[4]	138	118	157	109.0	92.8	123.2	4.8	4.7	4.9	3.5	4.0	3.1	7,695	8,750
Under 5	177	174	180	122.5	130.4	114.8	13.0	14.0	12.1	7.4	8.0	6.7	644	662
5–9	184	175	192	148.5	137.7	159.4	3.4	2.7	4.1	1.9	1.5	2.1	741	734
10–14	162	145	177	123.1	95.6	115.0	3.7	3.9	3.5	2.7	3.2	2.3	633	699
15–19	115	100	129	88.0									673	745
20–24	111	90	164	97.5	73.4	134.4	2.5	3.0	2.0	1.9	3.4	1.2	697	811
25–29	147			115.3									625	685
30–34	143	112	162	118.6	93.8	135.1	3.6	3.5	3.8	2.6	3.1	1.6	577	654
35–39	134			113.0									575	664
40–49	134	120	146	106.6	95.6	116.3	3.7	3.9	3.4	2.7	3.3	2.3	560	614
50–59	113	100	123	92.2	81.8	100.9	6.4	6.0	8.4	5.7	6.7	6.3	465	547
60 and over	115	77	144	85.8	51.5	111.9	8.4			7.3			621	813
Cases, all ages	2,275	905	1,370	1,792	714	1,078	79	36	43					

See footnotes at end of table.

TABLE 1.—*Age and sex incidence of certain respiratory diseases in canvassed families during five epidemics,[1] 1918–44*—Continued

Age	Case rate per 1,000 population									Percent of total cases complicated by pneumonia			Number of persons canvassed	
	Total influenza, grippe, pneumonia, and colds in bed[2]			Influenza and grippe			Pneumonia[3]							
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Male	Female
	Epidemic of 1939–40 (December 1939–March 1940)													
All ages[4]	92	76	108	52.3	44.9	59.6	4.2	3.9	4.5	4.6	5.1	4.2	3,006	3,104
Under 5	92	83	102	38.4	37.6	39.2	9.6	15.0	3.9	10.4	18.2	3.8	266	255
5–9	165	132	204	78.2	77.8	78.7	6.3	7.8	4.6	3.8	5.9	2.3	257	216
10–14	103	94	111	46.3	40.8	51.6	2.8		5.5	3.0		5.7	245	252
15–19	81	77	86	47.5	47.0	47.9							298	292
20–29	78	66	90	41.1	35.1	53.3	3.4	5.1	1.7	4.3	7.7	1.9	593	600
30–39	85	74	95	53.3	58.0	48.6	5.0	2.0	8.1	6.0	2.7	8.5	500	494
40–49	92	57	127	[illegible]	32.0	[illegible]	2.1	[illegible]	2.4	2.6	4.3	1.9	406	416
50–59	97	86	108	57.8	51	61.0	3.1	1.9	5.2	3.5	3.0	5.3	291	297
60 and over	65	34	91	45.4	30.2	58.2	3.9			6.1			232	275
Cases, all ages	569	235	334	324	139	185	26	12	11					
	Epidemic of 1940–41 (December 1940–March 1941)													
All ages[4]	106	104	108	60.3	58.8	61.8	4.5	5.1	3.9	4.3	4.9	3.6	2,553	2,555
Under 5	117	123	110	44.3	59.1	28.7	14.0	9.1	19.1	12.0	7.4	17.4	220	209
5–9	194	173	218	97.1	79.2	117.3	5.2	9.9		2.7	5.7		202	179
10–14	111	101	121	44.3	45.2	43.5	5.6	9.1	2.2	5.5	8.0	2.4	199	207
15–19	95	125	66	53.8	58.3	49.4							240	243
20–29	92	85	99	57.4	51.2	63.6	1.0	2.0		1.1	2.3		508	503
30–39	98	90	106	62.3	59.1	[illegible]	2.4	2.4	2.4	2.4	2.6	2.3	421	414
40–49	103	87	119	[illegible]	53.9	71.6	4.5	6.0	3.0	4.3	6.9	2.5	334	335
50–59	104	129	78	[illegible]	95.8	57.6	2.1	2.3	6.5	2.0	2.3	7.5	240	243
60 and over	80	63	95	46.2	31.7	58.6	7.3			9.1			189	222
Cases, all ages	542	265	277	308	150	158	23	13	10					
	Epidemic of 1943–44 (Nov. 15, 1943–Jan. 31, 1944)													
All ages[4]	210	195	223	149.0	137.9	158.1	3.9	3.7	4.1	1.9	1.9	1.8	4,604	5,603
Under 5	300	310	290	161.0	181.0	140.0	6.1	6.5	1.3	2.0	2.1	.4	420	400
5–9	325	313	336	208.9	208.7	209.0	1.4			.4			345	354
10–14	226	231	221	138.3	139.0	[illegible]	1.3	.8		–	1.5		386	366
15–19	165	141	183	92	70.5	107.9							326	454
20–24	198	163	206	146.9	128.6	152.2	2.6	2.0	2.9	1.4	1.3	1.4	193	549
25–29	186			142.[illegible]									297	502
30–34	221	194	228	170.7	153.1	177.1	3.6	3.9	3.3	1.7	2.0	1.5	377	443
35–39	204			161.5									387	455
40–49	195	162	226	[illegible]	130.5	[illegible]	3.2		6.3	1.7		2.8	743	797
50–59	193	174	212	147.1	124.2	170.7	5.5	5.4	8.8	2.9	3.5	4.4	644	627
60 and over	163	131	187	134.1	109.2	152.7	9.2			5.6			467	622
Cases, all ages	2,147	897	1,250	1,521	635	886	40	17	23					

[1] Data for 1918–19, 1919–20, and 1928–29 were collected by a special canvass of families near the end of the respective epidemics except for a recanvass in January 1919 to cover a second epidemic wave (*2, 5, 12, 16* pp. *297–298*). The surveys covered white and colored families residing in districts scattered throughout Baltimore. Data for 1939–40 and 1940–41 were collected by monthly canvasses of families to secure a record of all illness, the survey covered white families in certain blocks of the Eastern Health District (Wards 6 and 7) (*9*). Data for 1943–44 were collected by a special canvass in February 1944, but a large proportion of the families had been visited periodically as late as 1941–1942, or the first half of 1943 in connection with the prior morbidity study (*9*). The survey covered white families residing in certain blocks of the Eastern Health District (Wards 6 and 7).

[2] In 1918–19 and 1919–20 severe colds, with 1 or more days in bed, were recorded as "doubtful" and included in the total; in 1928–29, 1939–40, 1940–41, and 1943–44 colds with 1 or more days in bed were included in the total.

[3] Pneumonia cases include a few fatal cases of influenza or grippe that were not designated as pneumonia in the family statement.

[4] All ages include a few of unknown age.

TABLE 2.—*Age and sex incidence of certain respiratory diseases in canvassed families during two epidemics,[1] 1921–23*

HAGERSTOWN, MD.

Age	Case rate per 1,000 population: Total influenza, grippe, pneumonia, and colds in bed — Both sexes	Male	Female	Influenza and grippe — Both sexes	Male	Female	Pneumonia[2] — Both sexes	Male	Female	Percent of total cases complicated by pneumonia[2] — Both sexes	Male	Female	Average number of persons under observation — Male	Female
	Epidemic of 1921–22 (Jan. 1–Apr. 30, 1922)													
All ages[3]	81	77	85	64.3	62.5	66.0	3.7	3.0	4.3	4.5	3.9	5.0	3,328	3,530
Under 5	91	81	102	53.4	44.9	63.4	19.4	12.0	28.2	21.4	14.8	27.6	334	284
5–9	97	120	71	74.0	102.6	42.8	4.6	2.2	7.1	4.7	1.8	10.0	458	421
10–14	106	127	86	87.9	104.2	71.4	4.6	4.7	4.5	5.7	5.3	6.3	355	350
15–19	50	42	58	41.9	31.4	51.6							287	310
20–24	41	54	60	33.0	45.3	54.2	.5	1.1		.7	1.6		230	255
25–29	81			65.8									234	298
30–34	68	77	80	50.9	60.4	65.0							252	279
35–39	91			76.3									228	244
40–49	93	90	105	80.9	75.0	86.4	1.1	1.1	1.0	1.2	1.9	.9	400	428
50–59	87	47	123	69.8	43.3	94.2							254	276
60 and over	71	42	94	58.6	29.4	81.2							238	308
Cases, all ages	558	257	301	441	208	233	25	10	15		-			
	Epidemic of 1922–23 (Dec. 17, 1922–Apr. 14, 1923)													
All ages[3]	206	183	227	183.8	161.6	204.7	6.3	6.5	6.1	3.1	3.6	2.7	3,385	3,600
Under 5	196	200	191	155.4	160.9	149.2	14.4	12.4	16.6	7.3	[illegible]	8.7	404	362
5–9	250	262	238	228.0	234.0	221.5	4.5	2.1	[illegible]	1.8	.8	2.9	470	429
10–14	230	208	251	213.4	191.1	235.1	3.8	4.7	[illegible]	1.8	2.4	1.3	361	370
15–19	179	176	183	155.6	144.4	166.1							284	301
20–24	140	119	215	131.3	108.4	198.2	3.0	4.4	1.8	1.7	3.7	.8	217	263
25–29	201			182.0									235	287
30–34	226	155	270	205.4	141.9	249.0	4.0	4.2	3.8	1.9	2.7	1.4	244	277
35–39	203			190.8									228	249
40–49	206	181	230	192.3	176.0	208.1	4.8	4.9	4.8	2.4	2.7	2.1	409	418
50–59	208	185	228	171.4	152.6	188.4	11.4	15.1	10.9	5.5	8.9	4.6	249	270
60 and over	207	154	247	177.9	130.8	214.5	14.3			6.9			214	275
Cases, all ages	1,437	618	819	1,284	547	737	44	22	22					

[1] Data collected in bimonthly canvasses of families to secure a record of all illness; the survey covered white families residing in districts scattered throughout Hagerstown (27).
[2] Pneumonia cases include a few fatal cases of influenza or grippe that were not designated as pneumonia in the family statement.
[3] All ages include a few of unknown age.

5). The data for 1 epidemic refer to families of medical officers of the Army, Navy, and Public Health Service scattered throughout the country who were reporting semimonthly to the Public Health Service on respiratory attacks (table 3). These 12 outbreaks represent all of the major epidemics since the beginning of 1918 and all of the minor outbreaks except those of the spring of 1928, the winters of 1932–33 and 1936–37, and 3 other small epidemics during the period 1934-39. The groups canvassed include whole villages or townships, or districts scattered throughout the localities surveyed, except that the Baltimore data for the last 3 epidemics pertain to a sample of the families residing in the Eastern Health District (Wards 6 and 7) of the city.

TABLE 3.—*Age incidence of influenza among the families of medical officers of the Army, Navy, and Public Health Service during one epidemic,*[1] *1925–26*

MEDICAL OFFICERS' FAMILIES IN VARIOUS STATES

Age	Case rate per 1,000 persons under observation		Number of cases		Average number of persons under observation
	Total influenza, grippe, and pneumonia	Influenza and grippe	Influenza and grippe	Pneumonia	
	Epidemic of 1925–26 (Dec. 20, 1925–Apr. 10, 1926)				
All ages	183	180	551	11	3,069
Under 5	256	250	82	2	328
5–9	257	239	66	5	276
10–14	133	133	36		271
15–19	136	136	18		132
20–29	114	114	26		229
30–39	192	186	138	4	740
40–49	178	178	108		606
50–59	151	151	57		377
60 and over	182	182	20		110

[1] Based on semimonthly reports of cases designated as influenza or grippe by the reporting medical officer during the 16-week period Population predominantly white, included large part of Medical Corps (*31*).

Cases reported in the surveys were classified as "pneumonia," "influenza and grippe," and "doubtful" or "colds in bed." These doubtful categories include head and chest colds and bronchitis with one or more days in bed. Colds not in bed and all tonsillitis were excluded from all categories. This classification was based on the diagnosis as reported by the family informant; however, other studies have indicated that the informant usually repeats with reasonable accuracy the doctor's statement to the family.

The present paper is concerned with the age and sex incidence of respiratory attacks during these various epidemics, with special reference to the recent outbreak of December-January 1943–44

AGE INCIDENCE

Because of the unusually high incidence in the young adult ages during the epidemic of 1918–19, of all influenza and particularly of cases complicated by pneumonia, there has been great interest in the age incidence of the disease in each succeeding epidemic. Moorehouse (*17*) contrasted the age incidence of influenza and pneumonia deaths in 1918 with the lesser epidemic of 1928–29, and a preceding publication from the Public Health Service (*7*) made a comparison by age and sex of not only the mortality but of total influenza incidence, pneumonia incidence, and the proportion of cases complicated by pneumonia in the same two epidemics. This study was based on the combined results of surveys made immediately following the 1918–19 and the 1928–29 epidemics in some 12 localities in the United States covering in each epidemic about 150,000 persons.

All cases.—Figure 1 shows the age incidence of the total influenza cases in Baltimore and other surveyed localities in the East during the several epidemics since 1918 The data include influenza, grippe,

pneumonia, and the severe colds that confined the patient to bed. In every instance the data refer to a period of 2½ to 4 months during which influenza was exceptionally prevalent in the community. Since there were no suitably comparable data available on the age incidence of minor respiratory attacks during nonepidemic periods, those here charted refer to total cases during the epidemic period and not to any excess over rates in nonepidemic periods. Figure 2 shows similar age curves except that they are plotted on a logarithmic

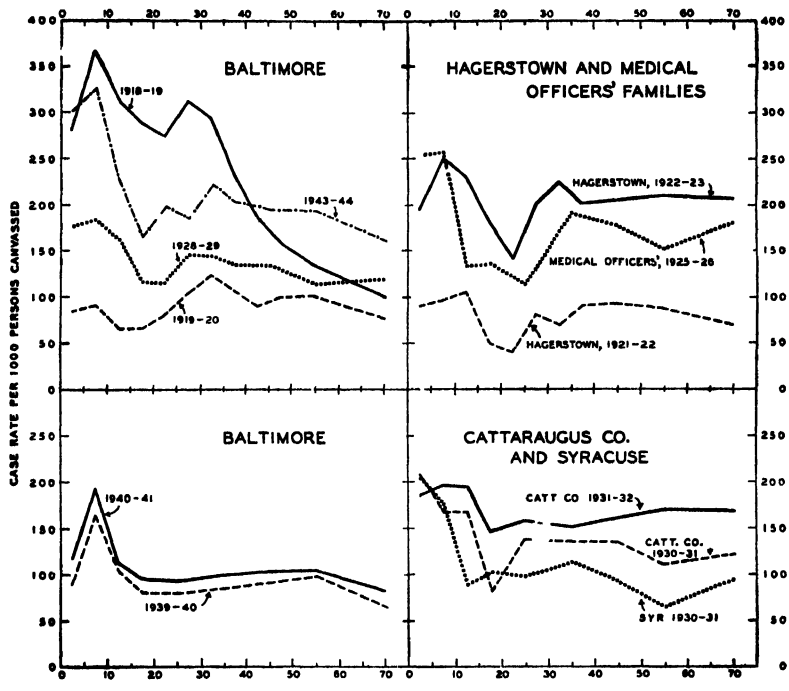

FIGURE 1.—Age incidence of certain respiratory diseases during 2- to 4-month epidemic periods, as recorded by special canvasses—Baltimore and other eastern localities, 1918–44. (Cases include influenza, grippe, pneumonia, and colds in bed.)

vertical scale and, with the exception of the South Carolina mill village, they include only cases designated by the family informant as influenza or grippe, excluding colds and pneumonia.

Although the periods covered varied in the different surveys, some rough comparison of actual case rates may be worth while. The rate in Baltimore for all types of cases (including colds in bed) was 210 per 1,000 canvassed population during a period of about 11 weeks in the epidemic of 1943–44, as compared with 138 in about the same period for the epidemic of 1928–29, and with 89 and 246 for somewhat longer periods in 1919–20 and 1918–19, respectively. For cases designated by the family informant as grippe or influenza (exclusive

of colds and pneumonia), the rate for the outbreak of 1943–44 was 149 per 1,000 as compared with 109 in 1928–29, 47 in 1919–20, and 196 in 1918–19. Thus in terms of cases of all types and of those specifically designated as grippe or influenza, the recorded rates in Baltimore for the recent outbreak were well above those for 1928–29 and 1920, but not up to the 1918 level [2]

The rates for the total group of 12 localities surveyed in 1918–19 and 1928–29 (7) were higher than in Baltimore. Total cases of all types showed rates of 294 per 1,000 in 1918–19 and 189 in 1928–29 for all

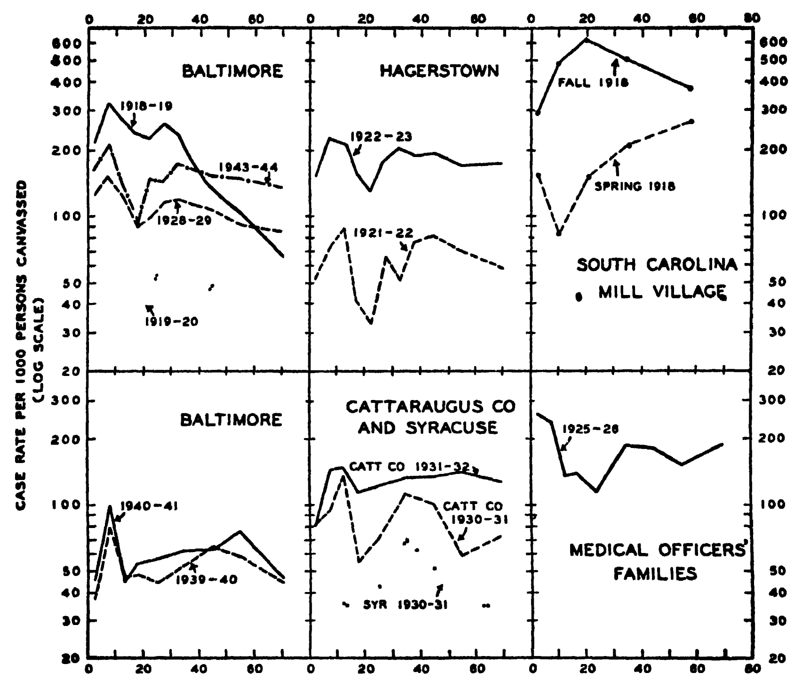

FIGURE 2.—Relative change with age in the incidence of influenza and grippe during 2 to 4 month epidemic periods, as recorded by special canvasses—Baltimore and other eastern localities, 1918 44 (Cases include influenza and grippe only, except in mill village)

localities as compared with 246 and 138, respectively, for Baltimore Grippe and influenza for all localities was 239 in 1918–19 and 145 in 1928–29, as compared with 196 and 109, respectively, for Baltimore For epidemics since 1940, no data are available except for Baltimore.

As may be seen in figures 1 and 2, there is much variation in the age curves in the several epidemics The 1918 Baltimore curve is the well-known 1918 influenza incidence curve, with a high case rate among children and young adults, greatly decreasing as age increases.

[2] Although part of the high recorded rate for 1943–44 may be due to the fact that some of the visiting in that year was done by canvassers who had visited the same families in a preceding morbidity study, one would not think that the type of enumeration was a major factor

TABLE 4—*Age and sex incidence of certain respiratory diseases in canvassed families during two epidemics 1930–32* [1]

SYRACUSE, N Y, AND CATTARAUGUS COUNTY, N Y

Age	Case rate per 1,000 persons under observation						Average number of persons under observation		
	Total influenza grippe, pneumonia,[2] and colds in bed			Influenza and grippe					
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Epidemic of 1930–31 (December 1930–March 1931) Syracuse								
All ages [3]	110	104	117	46.6	45.7	47.5	4,460	2,143	2,317
Under 5	203	182	221	63.9	42.4	82.1	360	165	195
5–9	176	181	171	39.6	51.2	29.2	455	215	240
10–14	88	103	87	35.5	36.9	38.2	422	225	197
15–19	103			39.7			378	182	196
20–29	97	62	129	42.3	33.0	51.0	567	273	294
30–39	113	106	120	71.4	71.7	71.2	672	321	351
40–49	93	99	87	49.8	52.8	46.9	642	322	320
50–59	64	67	87	36.0	38.3	33.7	472	220	252
60 and over	93			35.5			451	198	253
Cases, all ages	492	222	270	208	98	110			
	Epidemic of 1930–31 (January–April 1931) Cattaraugus County								
All ages [3]	140	133	148	87.3	78.1	97.3	2,749	1,434	1,315
Under 5	206	197	217	80.2	63.4	100.0	262	142	120
5–9	168	167	169	94.0	80.0	108.1	298	150	148
10–14	167	139	119	137.5	97.4	105.0	269	145	124
15–19	83			55.3			217	122	95
20–29	139	151	12[illegible]	6[illegible].3	81.4	56.3	332	172	160
30–39	135	120	1[illegible]0	114.1	108.4	119.8	333	166	167
40–49	134	99	173	101.7	76.9	120.6	344	182	162
50–59	111	104	130	57.2	53.5	79.9	297	147	150
60 and over	121			73.2			396	208	188
Cases, all ages	385	191	194	240	112	128			
	Epidemic of 1931–32 (January–April 1932) Cattaraugus County								
All ages [3]	170	163	179	126.8	113.5	141.3	4,055	2,123	1,932
Under 5	184	158	212	80.3	54.5	108.7	386	202	184
5–9	196	159	234	143.8	104.5	183	438	220	218
10–14	196	195	147	145.3	125.3	135.3	413	223	190
15–19	116			111.1			342	192	170
20–29	157	169	145	121.5	123.6	119.1	502	267	235
30–39	152	114	188	132.5	104.8	159.0	468	229	239
40–49	16[illegible]	17[illegible]	1[illegible]1	1[illegible]3.5	133.6	133.3	502	262	240
50–59	171	153	188	140.6	120.2	145.6	431	220	211
60 and over	168			125.9			564	301	263
Cases, all ages	690	345	345	514	241	273			

[1] Data collected by canvasses of families at intervals of 2 to 4 months to secure a record of all illness Population predominantly white In Syracuse the families resided in districts scattered throughout the city in Cattaraugus County 5 rural townships were completely canvassed (22)

[2] Pneumonia cases were too few to justify rates by age data for all ages follow

	Number of cases			Rate per 1,000 population			Percent of all cases complicated by pneumonia		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Syracuse 1930–31	12	3	9	2.7	1.4	3.9	2.4	1.4	3.3
Cattaraugus Co, 1930–31	4	2	2	1.5	1.4	1.5	1.0	1.0	1.0
Cattaraugus Co, 1931–32	18	12	6	4.4	5.7	3.1	2.6	3.5	1.7

[3] All ages include a few of unknown age

TABLE 5.—*Age and sex incidence of respiratory diseases in canvassed families during two epidemics,*[1] *1918*

MILL VILLAGE IN SOUTH CAROLINA

Age	Respiratory [2] case rate per 1,000 population			Number of respiratory cases [2]			Average number of persons under observation		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Epidemic of the fall of 1918 (September-November)								
All ages	464	455	471	236	112	124	509	246	263
Under 5	287	275	300	23	11	12	80	40	40
5-14	472	476	467	75	40	35	159	84	75
15-24	604	610	600	61	25	36	101	41	60
25-44	488	475	500	60	28	32	123	59	64
45 and over	370	364	375	17	8	9	46	22	24
	Epidemic of the spring of 1918 (March-May)								
All ages	151	126	174	85	34	51	562	269	293
Under 5	149	114	179	11	4	7	74	35	39
5-14	81	86	75	14	8	6	173	93	80
15-24	146	98	181	18	5	13	123	51	72
25-44	203	219	189	28	14	14	138	64	74
45 and over	259	115	393	14	3	11	54	26	28

[1] Data collected by semimonthly canvasses of all white families in the village to secure a record of all illness (*26*).

[2] Cases include those designated by the housewife as influenza, grippe, colds, and pneumonia, as follows: Fall of 1918, influenza and grippe, 186, colds, 49, pneumonia, 1; spring of 1918, influenza and grippe, 30, colds, 55, pneumonia, 0.

The 1919–20 curve lacks the high childhood incidence but has a young adult peak. The 1928–29 curve has a childhood and a young adult peak of approximately the same height. The age curve for the recent 1943–44 epidemic is somewhat different from all of these; it has a high peak in childhood, with a much smaller peak in the young adult ages and with little decline in the older ages. Part but not all of the high childhood peak is accounted for by the bed colds. In the minor epidemics of 1939–40 and 1940–41 the childhood peak is confined largely to the 5–9 year age group, the adult peak being practically absent in the data for all cases (fig. 1) but somewhat more prominent in the curves for grippe and influenza only (fig. 2).

The age curves for the several localities for the epidemics of 1921–22, 1922–23, 1925–26, 1930–31, and 1931–32 are variable, but they tend to follow the general pattern of that of 1928–29, with rates for young adults that approximate those for the preschool and early school ages. Data for the South Carolina mill village are of special interest because periodic visiting was continued from early spring until after the autumn epidemic; they thus show the striking contrast between the age distribution of respiratory attacks in the epidemics of the spring and fall of 1918.

TABLE 6.—*Age incidence of influenza and pneumonia during the epidemic of 1918–19 among canvassed households in a rural Maryland county, in minor Maryland towns, and in Baltimore* [1]

Age	Case rate per 1,000 population: Total influenza, grippe, pneumonia, and colds in bed			Pneumonia [2]	
	Charles Co., Md.	Minor Maryland towns	Baltimore, Md.	Minor Maryland towns	Baltimore, Md.
All ages	405	405	246	25.8	18.0
Under 5	380	414	283	38.2	27.3
5–9	448	493	366	21.6	13.4
10–14	486	512	317	15.2	11.3
15–19	508	493	289	19.3	18.5
20–24	493	476	275	37.0	21.1
25–29	465	485	314	39.7	29.4
30–34	441	488	295	46.2	21.8
35–39	407	421	229	38.8	18.4
40–44	349	321	185	14.9	10.7
45–49	277	300	158		
50–54	255	266	135	9.3	7.2
55–59	229	211	131		
60–64	211	183	124		
65–69	181	201	112	3.9	9.4
70–74	147	145	79		
75 and over	119	109	56		
Persons canvassed, all ages	16,147	12,482	33,361	12,482	33,361

[1] See text and text footnote for description of areas included. The surveys covered districts scattered throughout each minor town and covered all but 1 district of Charles County. Cases include those with onset from Sept. 1 to Dec. 1 to 15 in the minor towns and September–January in Charles County and Baltimore. See note to table 1 for Baltimore. Both white and colored families were included. Data from Britten (*2*).

[2] For pneumonia the rates for specific ages do not include deaths credited to influenza without mention of pneumonia as in table 1, but all ages include such influenza deaths. No data on pneumonia are available for Charles County.

Data on the 1918–19 epidemic in a group of smaller Maryland towns and rural areas and for the whole of Charles County, Md., are available (*2*, *12*) and are shown in table 6. It is seen here that these rural communities showed roughly the same type of curve as Baltimore, but the recorded incidence was considerably higher. For all ages the case rate in both Charles County and the minor Maryland towns [3] was 405 per 1,000 persons, as compared with 246 in Baltimore. The Charles County rate shows a single peak at 15–19 years, whereas in Baltimore and the minor towns there is a tendency for a secondary peak at 25 to 35 years of age.

[3] The surveyed group in each of the 5 localities included in the minor Maryland towns had higher rates than Baltimore: Cumberland 410 cases per 1,000 population canvassed, Frederick 321, Lonaconing 594, Salisbury 459, and 3 rural districts 324 cases per 1,000. The pneumonia case rate and the death rate from influenza and pneumonia, based on reports in the canvasses, were both higher in 4 of the 5 towns and rural areas than in Baltimore, Salisbury was the exception in pneumonia incidence and Frederick in mortality. Populations canvassed in the 4 towns ranged from about 1,700 to 5,200 persons of all ages. The 3 localities combined into the "rural area" group were Downsville District of Washington County and Linganore District of Frederick County with about 700 persons canvassed in each, and Quantico District of Wicomico County with about 100 persons canvassed (*2*, *12*).

Within Baltimore city the case rate varied considerably in the several districts surveyed. A preliminary report (*25*) shows rates in 10 districts of Baltimore as ranging from highs of 477 and 385 cases per 1,000 population to lows of 135 and 67 cases per 1,000. Populations canvassed in the 10 districts ranged from 665 to 1,740 persons, with only 2 districts with less than 900 persons.

Rates quoted above refer to influenza, grippe, pneumonia, and colds in bed.

TABLE 7.—*Age incidence of influenza in the epidemics of 1920 and of 1918–19 as recorded in a canvass of all families living on Kelleys Island (Ohio) at the time of the 1920 epidemic*[1]

Age	Case rate per 1,000 population[2]		Number of cases[2]		Population observed
	1920 epidemic	1918 epidemic	1920 epidemic	1918 epidemic	
All ages	536	197	369	136	689
Under 5	604	110	55	10	91
5–9	570	215	45	17	79
10–14	544	291	43	23	79
15–19	569	235	29	12	51
20–29	571	286	52	26	91
30–39	565	185	52	17	92
40–59	466	182	69	27	148
60 and over	414	69	24	4	58

[1] Data from Armstrong and Hopkins (*1*)

[2] Cases include influenza, pneumonia, and doubtful All cases in 1920 epidemic were in January and February except 3 before and 3 after those months Cases for 1918 were recorded at the time of the 1920 survey

In the Baltimore data, the 1919-20 epidemic shows influenza case rates that are considerably less than those for the epidemic of 1928–29 and are far less than the 1918–19 rates. This rather low rate for

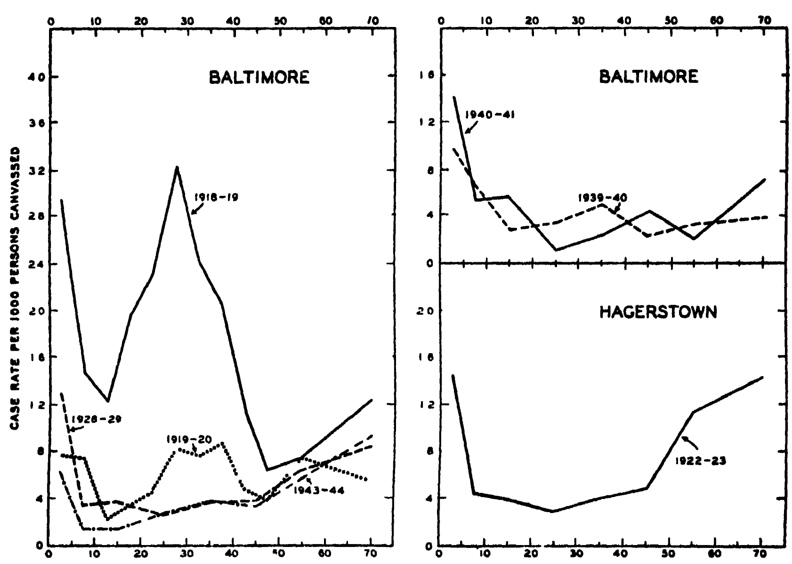

FIGURE 3—Age incidence of pneumonia during 2 to 4-month epidemic periods, as recorded by special canvasses Baltimore and Hagerstown, Md, 1918-44

Baltimore in 1920 may not be true of other sections of the country. An intensive study of the epidemic of 1920 among about 700 people living on Kelleys Island near Sandusky, Ohio (*1*), showed an influenza rate for all ages of 536 cases per 1,000 persons as compared with only 89 for Baltimore. The Kelleys Island age curve of the incidence of

influenza in the 1920 epidemic was also more similar to the usual 1918 age curve than was true for Baltimore. Reports on influenza in the 1918 epidemic made in 1920 by persons living on Kelleys Island in 1920 showed a rate in 1918 of only 197 cases per 1,000 persons, but with the characteristic 1918 age curve (table 7). Although these reports made 2 years after the epidemic may not be complete, it is true that in certain cities in this general east north central region the peak in influenza-pneumonia mortality for October 1918 was not much higher than the peak for February 1920 (*4*).

Pneumonia incidence.—The numbers of persons canvassed in the surveys discussed above in connection with figures 1 and 2 ranged from about 33,000 in the Baltimore studies of 1918–19 and 1919–20 to about 2,700 for the Cattaraugus County epidemic of 1930–31 and about 500 for the mill village epidemics of 1918. The numbers of cases of pneumonia in some of the smaller groups were insufficient to

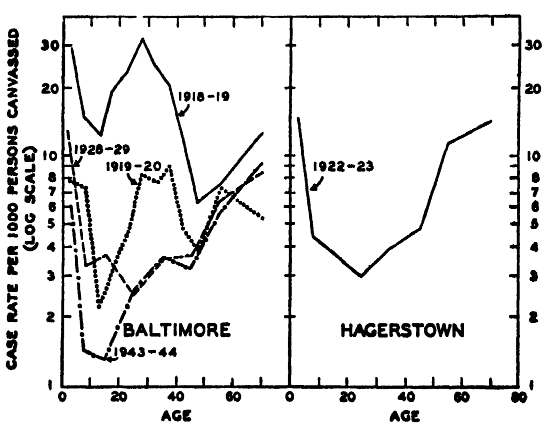

FIGURE 4.—Relative change with age in the incidence of pneumonia during 2- to 4-month epidemic periods, as recorded by special canvasses—Baltimore and Hagerstown, Md., 1918–44

give any idea of the pneumonia age curve, particularly in recent years when pneumonia rates were lower. Figure 3 shows pneumonia case rates for specific ages in 7 different epidemics, and figure 4 shows on a logarithmic vertical scale the same age curves for 5 of these epidemics.

Pneumonia shows the largest relative differences among the several epidemics. In the 1943–44 outbreak the incidence of pneumonia as recorded in the family survey was 3.9 cases per 1,000 population, as compared with 4.8 cases in 1928–29, 5.9 in 1919–20, and 18.0 in 1918–19.

Baltimore showed about average pneumonia incidence rates in the epidemics of 1918–19 and 1928–29 (*7*); case rates per 1,000 persons for all 12 surveyed localities were 17.6 in 1918–19 and 5.0 in 1928–29, as compared with rates for Baltimore of 18.0 and 4.8, respectively. The

percentage of all cases that were complicated by pneumonia in Baltimore was above the average. Proportions of cases complicated by pneumonia for all localities were 6.3 percent for 1918–19 and 2.6 for 1928–29, as compared with percentages for Baltimore of 7.3 and 3.5, respectively.[4]

In Baltimore the 1918 epidemic shows the well-known young adult pneumonia peak at 25–29 years, with a slightly higher case rate than among children under 5 years of age. Although the incidence is much lower in 1920, there is a definite tendency toward a flat-top peak among young adults extending from 25 to 40 years of age. This peak is particularly evident in the semilogarithmic chart (fig. 4) which shows relative rather than actual variation with age. In the 1928–29 data and in the recent epidemic of 1943–44 there is no evidence of a young adult peak, the highest rates occurring among the youngest and the oldest age groups, as is usual in pneumonia in more normal years. In the adult ages the 1943–44 pneumonia rate follows closely the rates for 1928–29, but under 20 years of age the rates in 1943–44 are below those of 1928–29. The pneumonia rates for the 1922–23 epidemic in Hagerstown and the 1939–40 and 1940–41 epidemics in Baltimore do not show any evidence of young adult peaks; the age curves (fig. 3) for these recent Baltimore epidemics are based on rather few cases, and minor variations in them are apparently due to chance.

Pneumonia complications.—Figure 5 shows for the same 5 epidemics the percentage of the total recorded cases of influenza, grippe, and colds in bed which were complicated by pneumonia. Figure 6 shows the same percentages plotted on a logarithmic vertical scale. It will be recalled that the minor respiratory case rate in the 1919–20 epidemic in Baltimore was rather low, so that the percentage of cases

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[4] Since influenza survey case data are available in 1943–44 only for Baltimore, it may be worth while to consider excess mortality from influenza and pneumonia in Baltimore as compared with the average for groups of cities (*3, 4*)

The total excess mortality from influenza and pneumonia during the whole epidemic in Baltimore in 1918–19 was 665 per 100,000, or 21 percent above that for 35 large cities (550) In 1920 the corresponding excess rate in Baltimore was 82 0 per 100,000, or 16 percent below that of the 35 large cities (97 2), and 17 percent below that of 95 cities (99 3) representing all geographic sections of the country In 1928–29 this same excess rate in Baltimore was 44 3 per 100,000 or 9 percent above that of the 35 large cities (40 8), but about the same as in the 95 representative cities (44 4) Preliminary computations for the epidemic of 1943–44 indicate that this total excess rate from influenza and pneumonia in Baltimore was 20 9 per 100,000 or 45 percent above the corresponding figure for the 35 large cities (14 4), and 35 percent above the figure for the 95 representative cities (15 5)

The excess mortality from all causes during the whole of the epidemic of 1943–44 in Baltimore was 54 6 per 100,000, or 10 percent above the corresponding figure for the 35 large cities (49 8) and 9 percent above the figure for the 90 large cities (49 9) included in the Weekly Mortality Index of the U S Bureau of the Census

To summarize, Baltimore excess mortality from influenza and pneumonia was above the average for other large cities in the epidemic of 1918–19, below the average in 1920, slightly above the average in 1928–29, and above the average for large cities in 1943–44

The normal or expected rates in the above computations were based on 7 year medians for the first 3 epidemics (*4*) and on a mean of the 2 preceding years in the preliminary computations for the 1943–44 epidemic Populations used in these computations are based on U S Census reports In the years since 1940 they pertain to the civilian population as based on ration book registrations, as most Army camps are outside of the city boundaries, no great error arises from this limitation Deaths for all cities include both resident and nonresident

complicated by pneumonia in 1919-20 is almost as high as it was in the 1918-19 epidemic. Moreover, the flat-top young adult peak

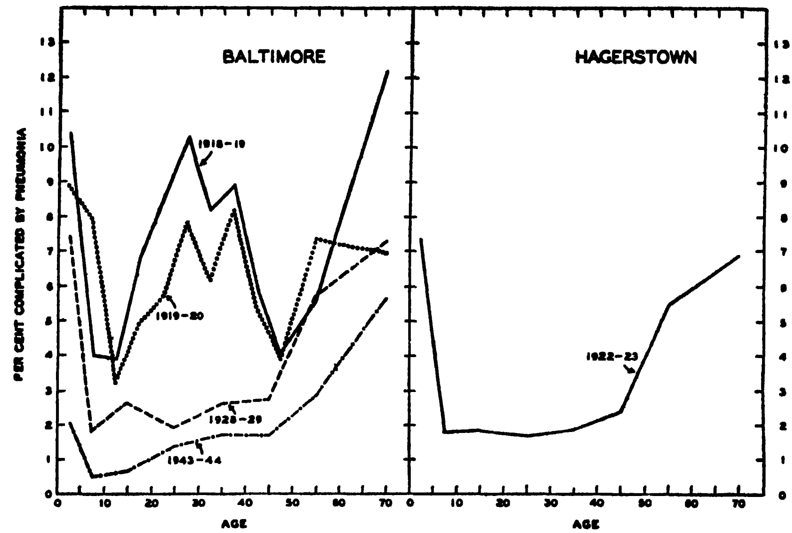

FIGURE 5.—Percentage of cases of certain respiratory diseases which were complicated by pneumonia—Baltimore and Hagerstown, Md., 1918-44. (Cases include influenza, grippe, pneumonia, and colds in bed.)

occurring between the ages of 25 and 40 years is quite similar in the two epidemics. The data for the 1943-44 epidemic, like those for

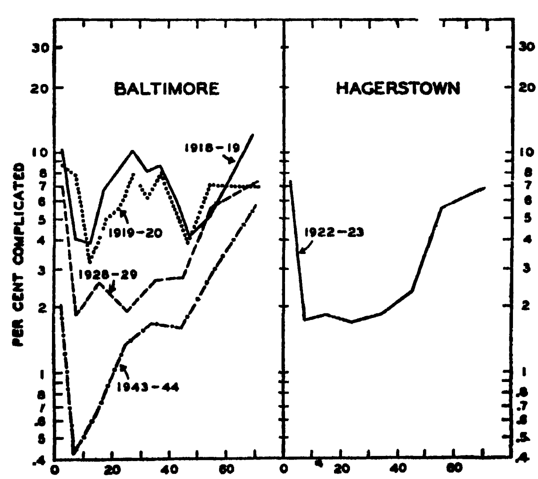

FIGURE 6.—Relative change with age in the percentage of cases of certain respiratory diseases which were complicated by pneumonia—Baltimore and Hagerstown, Md, 1918-44. (Cases include influenza, grippe, pneumonia, and colds in bed.)

1928-29, show no young adult peak. The general level of the proportion of all cases that were complicated by pneumonia is much lower

in 1943–44 than in the earlier epidemics, including that of 1928–29. For all ages combined, 7.3 percent of the 1918–19 cases were complicated by pneumonia, 6.6 percent of the 1919–20, and 3.5 percent of the 1928–29, as compared with only 1.9 for 1943–44. The percentage of cases complicated by pneumonia in the 1922–23 epidemic in Hagerstown shows an age curve that is similar to the Baltimore 1928–29 curve, with 3.1 percent of the cases for all ages recorded as complicated by pneumonia.

INCIDENCE AMONG MALES AND FEMALES

Data collected by house-to-house canvasses are not entirely reliable for sex comparisons because the informants are usually women who are able to report more completely upon their own minor illnesses than upon those of others in the household (*28*). Under these circumstances, minor respiratory rates for adult males that are equal to or greater than those for adult females are more significant than the reverse. Serious diseases like pneumonia would presumably be equally well reported for all members of the household, but the percentage of respiratory cases complicated by pneumonia would be influenced by the completeness of reporting of the total cases of respiratory illness.

Among children under 15 years of age the reports for both sexes are usually made by some adult in the household so that a comparison of boys and girls is fairly reliable even for minor conditions.

All cases.—Figure 7 shows for specific ages the incidence of influenza, grippe, pneumonia, and colds in bed among males and females. Considering all ages, the recorded rates for total cases and also for influenza and grippe are higher for females than males in every epidemic. However, in some of the outbreaks the differences are relatively small and are not consistent in the different age groups. Thus in Baltimore in the great epidemic of 1918–19 the rates for the two sexes are, with the exception of 15 to 30 years of age, roughly the same. In the Baltimore epidemics of 1943–44, 1939–40, 1928–29, and 1919–20 the recorded case rates are generally higher for females than for males. In the 1940–41 outbreak in Baltimore there is not much difference between the sexes, but in this and also in the minor Baltimore epidemic of 1939–40 the rather large peak at 5–9 years of age was higher for girls than for boys. The 2 Hagerstown epidemics show rather consistently higher rates for adult females, but the Cattaraugus County and Syracuse outbreaks do not show consistent differences between the sexes in the incidence of respiratory cases.

Pneumonia incidence.—Figure 8 shows pneumonia incidence rates among males and females of specific ages during four epidemics. Considering all ages combined and both minor and major epidemics, the pneumonia rate per 1,000 persons was slightly higher for females in 8 of the 11 epidemics, and higher for males in the other 3 outbreaks.

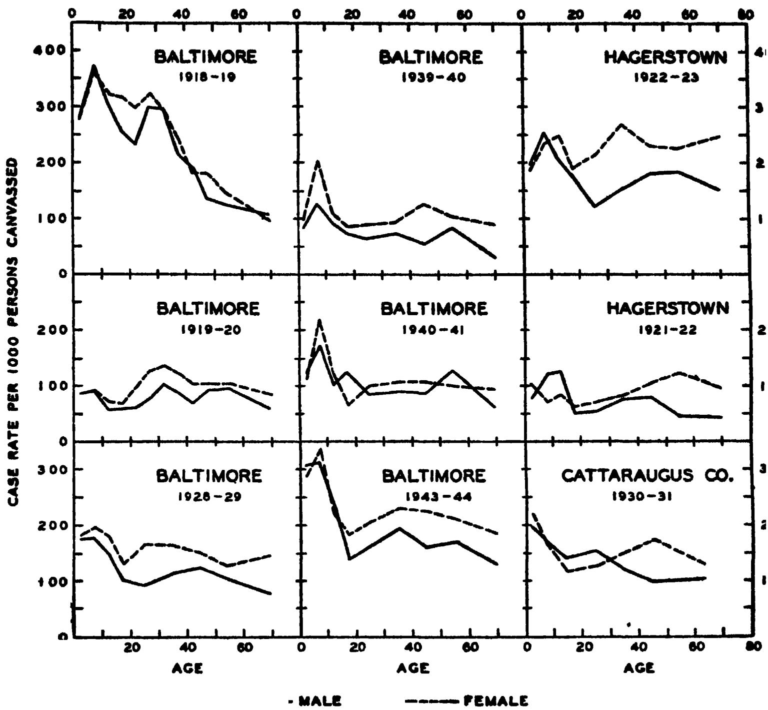

FIGURE 7.—Incidence of certain respiratory diseases among males and females of specific ages during 2- to 4-month epidemic periods—Baltimore and other eastern localities, 1918-44. (Cases include influenza, grippe, pneumonia, and colds in bed.)

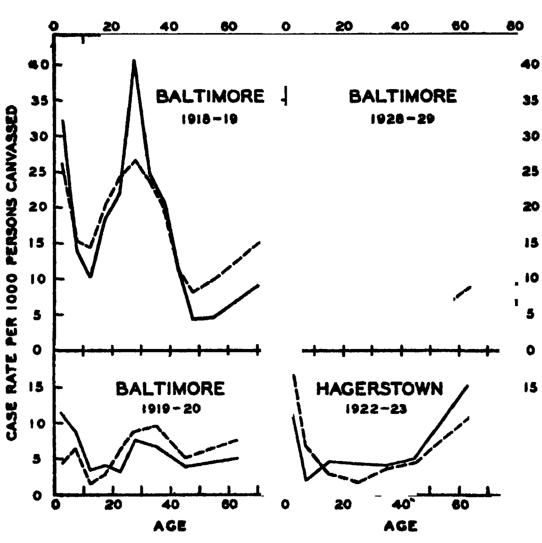

FIGURE 8.—Pneumonia incidence among males and females of specific ages during 2- to 4-month epidemic periods—Baltimore and Hagerstown, Md., 1918-44.

With the exception of the 1918–19 epidemic, when the peak at 25–29 was much higher for males than females, the differences between the sexes are not marked, particularly when one considers the rather small numbers of pneumonia cases on which the curves are based. The Baltimore epidemic of 1919–20 shows somewhat higher pneumonia rates for adult females than males but lower rates for girls than for boys under 15 years. The Hagerstown data for 1922–23 show practically the reverse situation, and the Baltimore data for 1928–29 show no consistent differences between the sexes. In

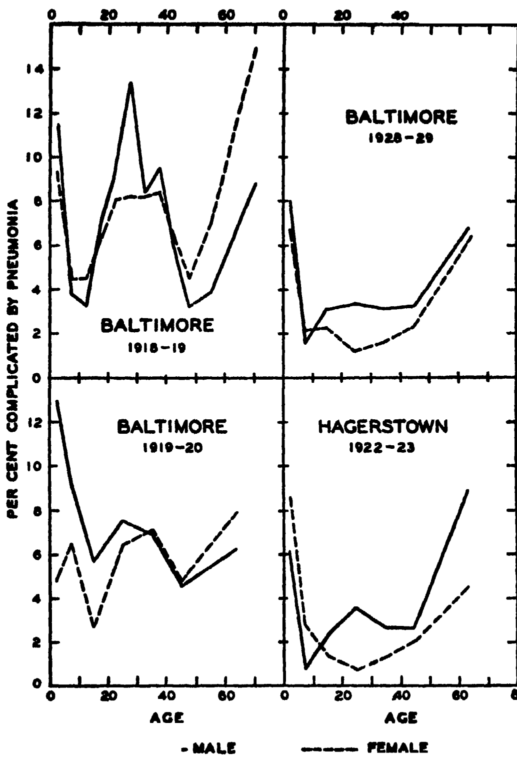

FIGURE 9.—Percentage of cases of certain respiratory diseases which were complicated by pneumonia, among males and females of specific ages—Baltimore and Hagerstown, Md., 1918–44. (Cases include influenza, grippe, pneumonia, and colds in bed.)

the other epidemics, including that of 1943–44, the numbers of pneumonia cases were too few for considering age-specific rates by sex.

Pneumonia complications.—With respect to the percentage of all cases (including bed colds) that were complicated by pneumonia, as shown in figure 9, the differences between the sexes are not consistent. Considering all ages, in 8 of the 11 epidemics the percentage of cases that were complicated by pneumonia was higher for males than females; in 2 epidemics the reverse was true; and in 1 epidemic the percentages were the same for males and females

SUMMARY

Since the 1918–19 influenza pandemic, the United States Public Health Service has collected by house-to-house canvass information about the extent and severity of influenza, grippe, and pneumonia during the various epidemics that have occurred. Of the 18 major or minor outbreaks of influenza that have occurred since the beginning of 1918, data of this kind are available for one or more localities for 12 epidemics. In 6 of these epidemics the data collected refer to Baltimore and in most of the others to surveys of localities in the eastern States. This paper presents age and sex variation in the incidence of influenza and grippe and their complications during these 12 epidemics, with special reference to the current 1943–44 outbreak.

There is great variability in the age curves of influenza and grippe in the several epidemics. The curve in the recent oubreak was in general similar to that of 1928–29 except for a very high incidence among children under 10 years of age. Considering actual rates, the recorded incidence for all ages in the 1943–44 outbreak was higher than in any other epidemic since that of 1918–19; the incidence among children under 10 years of age approximated that in 1918–19, and the incidence above 40 years was greater than in 1918–19 (figs. 1 and 2).

Pneumonia incidence in the current epidemic was far below that of 1918–19; there was no evidence of any young adult peak which was so striking in the great pandemic of 1918–19 and which persisted to a considerable extent in the epidemic of 1919–20. Among persons under 25 years of age the pneumonia rate was less in the current epidemic than in any of the others, but above 25 years the rates corresponded closely to those recorded for the epidemic of 1928–29 (figs. 3 and 4).

The percentage of the total cases that were complicated by pneumonia in the 1943–44 epidemic was far below the figure for any other epidemic for which data are available. Every age group showed this low proportion of cases complicated by pneumonia (figs. 5 and 6).

In most of the epidemics the rates for influenza and grippe were consistently higher for females than males, particularly adult females. However, this was not invariably true; the great 1918–19 epidemic and the minor outbreak of 1940–41 do not show consistent sex differences in the rates (fig. 7).

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DEATHS DURING WEEK ENDED OCTOBER 21, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 21, 1944	Corresponding week, 1943
Data for 92 large cities of the United States:		
Total deaths	8,982	8,647
Average for 3 prior years	8,371	
Total deaths, first 42 weeks of year	375,295	382,837
Deaths, under 1 year of age	648	575
Average for 3 prior years	595	
Deaths under 1 year of age, first 42 weeks of year	25,904	27,663
Data from industrial insurance companies:		
Policies in force	66,810,744	65,966,393
Number of death claims	12,706	12,244
Death claims per 1,000 policies in force, annual rate	9.9	9.7
Death claims per 1,000 policies, first 42 weeks of year, annual rate	10.0	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 28, 1944

Summary

Following last week's interruption in the downward trend begun in the week ended September 9, the incidence of poliomyelitis again declined. A total of 581 cases was reported, as compared with 722 last week, 363 for the corresponding week last year, and a 5-year (1939–43) median of 294. Increases occurred in only 5 of the 15 States reporting more than 9 cases each, as follows (last week's figures in parentheses): *Increases*—New Jersey 30 (26), Illinois 27 (19), Iowa 18 (13), North Carolina 21 (20), Kentucky 14 (11); *decreases*—Massachusetts 21 (32), New York 182 (259), Pennsylvania 36 (48), Ohio 25 (49), Michigan 19 (23), Minnesota 24 (26), Missouri 12 (13), Maryland 17 (19), Virginia 25 (28); *no change*—California 15 (15). The cumulative total is 17,437, as compared with 11,120 for the same period last year and a 5-year median of 7,885.

For the first time in 5 weeks a decrease occurred in the incidence of meningococcus meningitis. The total for the current week is 152 cases, as compared with 175 last week and a 5-year median of 35. States reporting more than 9 cases each are New York (25), Illinois (15), and Ohio (10). The total for the year to date is 14,481, as compared with 15,380 for the same period last year and a 5-year median of 1,705. The cumulative total since the week ended September 9, the week of lowest incidence for the year (110 cases) is 1,000, as compared with 1,358 and 370 for the corresponding 7-week periods of last year and 1942, respectively. The average for the corresponding periods of the years 1938–41 was 208 cases.

Of the current total of 1,549 cases of influenza, slightly more than for corresponding week of any recent year, 1,290 were reported in 3 States—Texas (925), South Carolina (211), and Virginia (154). These States also reported 1,114 of the total of 1,417 cases reported for the corresponding week last year. The cumulative figure since the week ended August 12, the week of lowest incidence, is 9,453, as compared with 10,064 for the same period last year.

A total of 8,998 deaths was recorded in 93 large cities of the United States for the current week, as compared with 9,021 last week and a 3-year (1941–43) average of 8,568. The cumulative figure is 386,218, as compared with 393,647 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended October 28, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis meningococcus		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Oct 28, 1944	Oct 30, 1943		Oct 28, 1944	Oct 30, 1943		Oct 28, 1944	Oct 30, 1943		Oct 28, 1944	Oct 30, 1943	
NEW ENGLAND												
Maine	0	0	0	1			1	46	46	1	3	2
New Hampshire	0	0	0				11	1	1	0	0	0
Vermont	0	0	0				0	66	20	0	0	0
Massachusetts	3	5	5				94	176	159	5	12	2
Rhode Island	0	0	0	12			2	26	15	1	3	0
Connecticut	0	0	0		5	1	1	6	8	4	8	0
MIDDLE ATLANTIC												
New York	11	6	16	[1] 4	[1] 5	[1] 5	31	166	89	25	26	1
New Jersey	10	2	8	2	4	3	12	132	40	4	6	1
Pennsylvania	14	13	13	2	1		36	68	112	9	15	5
EAST NORTH CENTRAL												
Ohio	4	15	20	5	2	6	6	262	23	10	4	1
Indiana	18	12	12	8	12	12	4	56	16	4	2	1
Illinois	2	12	12	7	9	8	13	23	23	15	10	2
Michigan [2]	21	10	6	1			8	255	67	8	7	2
Wisconsin	1	6	1	9	6	18	15	390	53	3	5	1
WEST NORTH CENTRAL												
Minnesota	13	8	3	1		1	1	292	12	1	2	1
Iowa	2	2	2			1	3	7	14	0	3	1
Missouri	4	4	10	5	6	2	1	[illegible]	5	5	6	0
North Dakota	1	2	0				2	99	7	0	0	0
South Dakota	0	4	3				4	5	2	2	1	0
Nebraska	3	6	3	1	3		6	6	6	1	1	0
Kansas	4	4	4			1	10	3	16	0	3	0
SOUTH ATLANTIC												
Delaware	1	0	0				0	14	1	0	2	0
Maryland [2]	6	4	5	2	2	2	3	[illegible]	5	3	7	1
District of Columbia	0	1	1	2			2	5	2	2	7	0
Virginia	9	15	46	154	128	128	3	85	29	8	12	1
West Virginia	0	2	14	8		2	3	60	2	1	0	0
North Carolina	27	43	85	6	5	3	10	45	45	4	2	2
South Carolina	11	8	30	211	249	201	6	21	4	2	1	1
Georgia	30	19	33	19	17	19	3	13	3	2	3	1
Florida	13	21	8	2	1	2	1	14	2	1	2	1
EAST SOUTH CENTRAL												
Kentucky	6	9	20		2	1	4	6	6	1	4	2
Tennessee	14	14	16	15	1	8	5	38	13	1	6	3
Alabama	54	37	41	27	30	30	3	16	3	5	2	1
Mississippi [2]	29	8	14							2	2	1
WEST SOUTH CENTRAL												
Arkansas	21	3	14	19	15	24	0	2	4	0	1	1
Louisiana	41	2	5		1	4	4	1	1	1	3	0
Oklahoma	6	2	12	15	20	51	9	4	4	2	0	0
Texas	86	45	47	925	737	503	34	17	17	4	2	0
MOUNTAIN												
Montana	0	1	2	4			2	70	9	0	0	0
Idaho	0	0	0	2			5	0	9	1	0	0
Wyoming	4	2	1		2	2	0		4	0	0	0
Colorado	4	12	9	8	15	15	5	11	16	0	4	0
New Mexico	2	6	1		1	1	1	1	6	2	1	0
Arizona	1	3	5	44	79	65	2	5	14	0	1	0
Utah [2]	0	0	0	2		1	4	3	6	0	2	0
Nevada	0	0	0				0	1	0	0	1	0
PACIFIC												
Washington	19	9	2		31		28	25	25	2	7	1
Oregon	7	2	2	8	9	9	35	23	18	1	1	1
California	35	30	23	18	19	28	1[illegible]2	57	57	9	8	3
Total	537	409	596	1,549	1,417	1,330	585	2,639	1,435	152	198	35
43 weeks	10,234	10,712	12,027	347,567	91,225	156,891	595,989	551,026	474,381	14,481	15,380	1,705

[1] New York City only [2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended October 28 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended		Median 1939-43	Week ended—		Median 1939-43
	Oct 28 1944	Oct 30, 1943		Oct 28, 1944	Oct 30 1943		Oct 28, 1944	Oct 30, 1943		Oct 28, 1944	Oct 30, 1943	
NEW ENGLAND												
Maine	0	0	0	34	17	11	0	0	0	1	0	1
New Hampshire	0	0	0	3	8	8	0	0	0	0	0	0
Vermont	0	1	1	9	10	10	0	0	0	0	2	0
Massachusetts	21	7	5	131	121	108	0	0	0	5	4	3
Rhode Island	0	[illegible]	0	8	1	3	0	0	0	0	0	0
Connecticut	8	[illegible]	2	[illegible]	31	21	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	182	26	[illegible]	173	[illegible]	163	0	0	0	3	7	8
New Jersey	30	4	5	38	48	59	0	0	0	5	1	1
Pennsylvania	36	6	6	140	139	115	0	0	0	11	3	7
EAST NORTH CENTRAL												
Ohio	25	3	8	204	257	171	0	0	0	0	4	5
Indiana	8	4	5	41	67	51	0	1	1	0	1	1
Illinois	27	35	12	153	108	160	1	0	1	3	2	13
Michigan [2]	19	17	17	97	117	119	0	0	0	1	1	4
Wisconsin	5	13	4	60	[illegible]	104	0	0	0	1	1	1
WEST NORTH CENTRAL												
Minnesota	24	7	13	46	61	57	0	0	0	0	0	1
Iowa	18	4	4	38	57	57	0	0	1	0	5	2
Missouri	12	0	1	30	33	44	0	0	0	1	2	2
North Dakota	0	1	1	5	9	9	0	0	0	0	0	0
South Dakota	0	0	2	17	12	20	0	0	0	1	1	1
Nebraska	4	3	3	24	43	22	0	0	0	0	0	0
Kansas	4	21	11	74	55	59	0	0	0	2	0	1
SOUTH ATLANTIC												
Delaware	8	0	0	0	1	7	0	0	0	1	1	2
Maryland [2]	17	1	1	58	35	32	0	0	0	1	0	6
District of Columbia	6	2	0	14	18	13	0	0	0	0	0	0
Virginia	25	1	2	80	34	52	0	0	0	3	6	9
West Virginia	8	0	1	78	63	51	0	0	0	1	1	3
North Carolina	21	1	1	52	113	123	0	1	0	2	2	3
South Carolina	4	0	1	13	13	13	0	0	0	0	0	8
Georgia	1	0	1	30	49	38	0	0	0	[illegible]	4	8
Florida	4	0	1	13	11	7	0	0	0	4	0	1
EAST SOUTH CENTRAL												
Kentucky	14	6	[illegible]	26	50	62	0	0	0	5	4	5
Tennessee	4	0	1	94	38	80	0	0	0	2	4	6
Alabama	4	3	4	36	38	38	0	0	0	2	5	7
Mississippi	2	0	2	23	11	14	0	1	0	0	5	4
WEST SOUTH CENTRAL												
Arkansas	0	0	2	20	[illegible]	7	0	0	0	3	0	6
Louisiana	4	0	1	15	8	8	0	0	0	9	0	6
Oklahoma	1	8	0	20	8	20	0	0	1	0	1	4
Texas	7	19	7	75	41	41	0	0	1	10	8	12
MOUNTAIN												
Montana	0	0	0	20	31	18	1	0	0	1	0	0
Idaho	0	2	2	82	13	13	3	0	0	2	0	0
Wyoming	0	1	0	3	1	3	0	0	0	0	0	0
Colorado	1	8	2	46	21	21	2	0	0	2	0	5
New Mexico	0	2	1	7	6	6	0	0	0	2	3	2
Arizona	0	3	1	10	15	1	0	0	0	3	1	1
Utah [2]	0	15	7	3	13	10	0	0	0	0	0	0
Nevada	0	2	0	3	1	0	0	0	0	0	0	0
PACIFIC												
Washington	9	37	6	38	61	28	0	0	0	5	2	2
Oregon	3	27	3	36	19	13	0	0	1	2	2	2
California	15	58	21	166	148	103	0	0	0	2	4	5
Total	581	363	294	2 412	2 355	2 284	7	3	14	103	88	178
43 weeks	17 437	11 120	7,885	160 516	113,474	113 474	336	648	1,244	4,786	4,827	7,419

[2] Period ended earlier than Saturday

[3] *Including paratyphoid fever cases reported separately as follows* Maine, 1, Massachusetts, 5, New Jersey, 1, Delaware, 1, Georgia, 1, Florida, 1, Louisiana, 1, Colorado, 2

Telegraphic morbidity reports from State health officers for the week ended October 28, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough, Week ended— Oct 28 1944	Whooping cough, Week ended— Oct 30 1943	Whooping cough, Median 1939 43	Week ended October 28 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	7	8	19	0	0	0	0	0	0	0	0	0
New Hampshire	3	1	2	0	0	0	0	0	0	0	0	0
Vermont	16	27	24	0	0	0	0	0	0	0	0	0
Massachusetts	43	87	134	0	0	7	0	0	0	0	0	0
Rhode Island	2	13	13	0	0	0	0	0	0	0	0	0
Connecticut	52	32	54	0	0	5	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	199	250	387	0	1	61	0	1	1	2	0	0
New Jersey	79	69	131	0	0	0	0	1	0	0	0	0
Pennsylvania	123	154	238	0	0	0	0	0	0	1	0	0
EAST NORTH CENTRAL												
Ohio	77	86	169	0	0	0	0	0	0	0	0	0
Indiana	11	16	19	0	1	0	0	1	0	0	0	0
Illinois	91	137	171	0	0	1	0	0	0	0	1	0
Michigan [3]	50	128	154	0	1	19	0	0	0	0	0	0
Wisconsin	77	175	168	0	0	0	0	1	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	53	55	55	0	1	0	0	0	0	0	0	0
Iowa	2	22	18	0	1	0	0	0	0	0	0	0
Missouri	25	16	22	0	0	0	2	0	0	0	0	0
North Dakota	6	8	8	0	0	0	7	0	0	0	0	0
South Dakota	20	5	0	0	0	0	0	0	0	0	0	0
Nebraska	9	21	9	0	0	0	0	0	0	0	0	0
Kansas	18	39	35	0	4	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	5	0	4	0	0	0	0	0	0	0	0	0
Maryland [3]	81	31	56	0	0	0	3	0	0	0	0	0
District of Columbia	6	10	12	0	0	0	0	0	0	0	0	0
Virginia	24	58	35	0	0	0	86	0	0	1	0	0
West Virginia	13	2	22	0	0	0		0	0	0	0	0
North Carolina	50	130	61	0	0	0	0	0	0	0	0	11
South Carolina	27	32	21	0	0	0	0	0	0	0	0	5
Georgia	6	9	9	0	0	1	0	0	0	0	1	33
Florida	3	19	6	0	3	1	0	1	0	0	0	13
EAST SOUTH CENTRAL												
Kentucky	12	64	64	0	0	9	0	0	0	0	0	0
Tennessee	17	27	35	0	0	0	1	0	0	0	1	5
Alabama	20	6	28	0	0	0	0	0	0	0	0	26
Mississippi [3]				0	0	0	0	0	0	0	0	7
WEST SOUTH CENTRAL												
Arkansas	16	25	14	0	2	1	0	0	0	0	0	0
Louisiana	0	1	5	0	0	1	0	0	0	0	2	13
Oklahoma	2	1	5	0	0	0	5	0	0	0	0	0
Texas	127	68	69	0	23	505	1	0	0	0	1	48
MOUNTAIN												
Montana	25	23	18	0	1	0	0	0	0	0	0	0
Idaho	15	0	2	0	0	0	0	0	0	0	0	0
Wyoming	5	10	8	0	0	0	0	0	0	0	0	0
Colorado	2	52	27	0	0	0	0	0	0	0	0	0
New Mexico	5	3	8	0	0	4	5	0	0	0	0	0
Arizona	7	15	10	0	0	0	25	0	0	0	0	0
Utah [3]	15	16	16	0	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	6	87	56	0	0	1	0	1	0	0	0	0
Oregon	6	54	14	0	0	0	0	0	0	0	1	0
California	87	85	155	0	2	8	0	5	1	0	0	0
Total	1 545	2 177	2 597	0	40	624	138	12	2	4	7	161
Same week 1943	2 177			3	33	277	83	6	1	5	8	109
Same week 1942	2 597			2	35	170	135	16	1	4	3	112
43 weeks 1944	79 434			37	1 524	19 750	7 631	564	27	444	471	4,292
43 weeks 1943	156 828			56	1 779	13 982	6 674	592	24	425	689	3 588
43 weeks 1942	149,727		[4] 150 098	70	1 032	10 802	5 965	482	40	[4] 445	744	[4] 2 392

[3] Period ended earlier than Saturday

[4] 5 year median 1939-43.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 21, 1944

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urgan incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	---	0	0	0	2	0	3	0	0	1
New Hampshire:												
Concord	0	0	---	0	0	0	1	0	1	0	0	0
Vermont:												
Barre	0	0	---	0	0	0	1	0	0	0	0	0
Massachusetts:												
Boston	0	0	---	0	43	3	13	13	28	0	1	20
Fall River	0	0		0	0	0	1	0	1	0	0	5
Springfield	0	0	---	0	1	0	2	0	5	0	0	1
Worcester	0	0	---	0	3	0	7	4	21	0	0	10
Rhode Island:												
Providence	2	0	---	0	0	0	3	0	5	0	0	8
Connecticut:												
Bridgeport	0	0	---	0	0	2	0	1	6	0	0	1
Hartford	0	0	---	0	4	1	1	0	1	0	0	2
New Haven	0	0	1	0	0	1	1	1	4	0	0	14
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	---	0	0	0	7	5	2	0	1	2
New York	9	2	2	1	8	17	68	98	70	0	5	72
Rochester	0	0	---	0	3	3	0	12	0	0	0	9
Syracuse	0	0	---	0	0	0	0	0	4	0	0	1
New Jersey:												
Camden	0	0		0	0	0	1	2	0	0	0	0
Newark	0	0		0	1	2	4	0	2	0	0	1
Trenton	0	0		0	0	0	3	2	0	0	0	0
Pennsylvania:												
Philadelphia	3	0	5	1	4	4	34	6	36	0	4	16
Pittsburgh	0	0	2	2	1	3	8	0	11	0	0	8
Reading	0	0	---	0	1	0	1	0	0	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	---	0	0	2	2	4	23	0	0	7
Cleveland	0	0	1	0	1	5	8	16	17	0	2	11
Columbus	0	0	2	2	1	1	1	0	2	0	0	4
Indiana:												
Fort Wayne	0	0	---	0	0	0	2	0	0	0	0	0
Indianapolis	3	0	---	3	1	2	10	2	8	0	0	2
South Bend	6	0	---	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	---	0	1	0	3	0	0	0	0	0
Illinois:												
Chicago	0	0	25	3	16	4	22	4	33	0	0	35
Springfield	0	0	---	0	3	2	0	0	3	0	0	0
Michigan:												
Detroit	12	20	---	1	3	2	12	8	20	0	2	13
Flint	0	0	---	0	0	0	3	0	0	0	0	0
Grand Rapids	0	0	---	0	0	0	0	1	9	0	0	0
Wisconsin:												
Kenosha	0	0	---	0	0	0	0	0	0	0	0	8
Milwaukee	0	0	---	0	0	1	3	0	7	0	0	12
Racine	0	0	---	0	1	0	0	0	3	0	0	1
Superior	0	0	---	0	0	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	---	0	0	2	0	5	2	0	0	2
Minneapolis	14	0	---	0	1	1	6	7	4	0	0	2
St. Paul	0	0	---	0	0	0	2	2	8	0	0	22

See footnotes at end of table.

City reports for week ended October 21, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri:												
Kansas City	0	0	------	0	1	2	1	0	5	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	1	0	0	0
St. Louis	0	0	1	2	0	5	13	3	10	0	2	10
North Dakota:												
Fargo	1	0	------	0	0	0	0	0	1	0	0	0
Nebraska:												
Omaha	0	0	------	0	2	0	4	0	1	0	1	0
Kansas:												
Topeka	0	0	------	0	0	1	0	0	4	0	0	2
Wichita	0	0	------	0	0	0	0	0	2	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	1	6	3	0	0	0	0
Maryland:												
Baltimore	4	0	------	0	2	1	4	6	14	0	0	63
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	1	0	3	0	9	9	9	0	0	10
Virginia:												
Lynchburg	0	0	------	0	0	0	0	1	0	0	0	0
Richmond	1	0	1	0	0	0	1	3	5	0	0	0
Roanoke	0	0	------	0	0	0	2	0	1	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	5	0	0	0
Wheeling	0	0	------	0	0	0	1	0	1	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	1	0	2	0	0	1
Wilmington	4	0	------	0	0	0	2	1	3	0	0	0
Winston-Salem	0	0	------	0	2	0	1	0	8	0	0	3
South Carolina:												
Charleston	0	0	4	0	0	0	1	0	2	0	0	0
Georgia:												
Atlanta	0	0	11	0	1	0	4	1	3	0	0	0
Brunswick	0	0	------	0	3	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	0	0	0	0
Florida:												
Tampa	2	0	1	0	0	0	0	0	1	0	1	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	0	2	2	4	0	7	0	1	3
Nashville	0	0	------	0	0	0	0	0	3	0	0	0
Alabama:												
Birmingham	0	0	2	0	0	0	5	0	1	0	0	0
Mobile	1	0	1	0	0	0	0	0	2	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	0	0	0	0	1	0	0	0
Louisiana:												
New Orleans	4	0	------	0	1	0	13	6	5	0	0	0
Shreveport	2	0	------	0	0	0	2	0	0	0	0	0
Texas:												
Dallas	5	0	------	0	0	0	2	0	3	0	1	1
Galveston	0	0	------	0	0	0	0	0	0	0	0	0
Houston	7	1	------	0	0	0	5	1	8	0	2	3
San Antonio	0	0	1	1	0	0	1	0	3	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	3	0	0	0	0	3
Great Falls	1	0	------	0	0	0	1	1	7	0	0	0
Helena	0	0	------	0	0	0	1	0	0	0	0	0
Missoula	0	0	------	0	1	1	0	0	0	0	0	0

See footnotes at end of table.

City reports for week ended October 21, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
MOUNTAIN—continued												
Idaho												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado												
Denver	1	0	2	0	1	0	5	0	9	0	0	3
Pueblo	0	0		0	0	0	0	0	4	0	0	0
Utah												
Salt Lake City	0	0		0	2	0	3	0	4	0	0	1
PACIFIC												
Washington												
Seattle	0	0		0	[illegible]	0	[illegible]	2	5	0	1	0
Spokane	0	0		0	4	0	1	1	1	0	0	0
Tacoma	0	0		0	0	0	1	0	0	0	0	1
California												
Los Angeles	13	0	1	0	6	3	2	1	40	0	1	7
Sacramento	1	2	1	0	3	0	0	0	4	0	0	2
San Francisco	0	0		0	11	0	7	2	11	0	0	0
Total	98	25	6	16	148	71	343	234	537	0	25	405
Corresponding week 1943	70		44	10	516		336		616	0	18	634
Average, 1939-43	86		63	[1] 18	[2] 318		[1] 303		517	0	28	930

[1] 3-year average, 1941-43
[2] 5-year median, 1939-43

Dysentery, amebic.—Cases: Boston, 2; New York, 2; Chicago, 6; Detroit, 1; Atlanta, 1; Tampa, 1; Nashville, 1.

Dysentery, bacillary.—Cases: Providence, 2; New Haven, 1; New York, 11; Rochester, 2; Syracuse, 14; Detroit, 11; St. Louis, 2; Charleston, S. C., 9; Shreveport, 1; Los Angeles, 12; San Francisco, 1.

Dysentery, unspecified.—Cases: Richmond, 3.

Tularemia.—Cases: St. Louis, 1.

Typhus fever, endemic.—Cases: Wilmington, N. C., 3; Charleston, S. C., 2; Savannah, 5; Memphis, 1; Mobile, 2; Dallas, 1; Galveston, 1; Houston, 8; San Antonio, 2; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (estimated population, 1943, 34,394,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.2	0.0	2.6	0.0	133	18.3	83.6	49.7	196	0.0	2.6	162
Middle Atlantic	5.6	0.9	4.2	1.9	8	13.4	58.3	57.9	58	0.0	4.6	51
East North Central	12.8	12.2	17.0	5.5	16	11.6	40.1	21.3	77	0.0	2.4	57
West North Central	29.8	0.0	2.0	4.0	8	21.9	51.7	33.8	76	0.0	6.0	78
South Atlantic	18.0	0.0	29.4	0.0	18	3.3	52.3	39.2	88	0.0	1.6	126
East South Central	11.8	0.0	17.7	0.0	12	11.8	53.1	0.0	77	0.0	5.9	18
West South Central	54.5	2.9	2.9	2.9	3	0.0	66.0	20.1	57	0.0	8.6	11
Mountain	15.9	0.0	15.9	0.0	40	7.9	103.3	7.9	191	0.0	0.0	56
Pacific	22.1	3.2	3.2	0.0	46	4.7	25.3	9.5	96	0.0	3.2	16
Total	14.9	3.8	9.9	2.4	22	11.2	52.1	35.6	82	0.0	3.8	62

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 7, 1944.—During the week ended October 7, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		10		32	61	9	7	18	17	154
Diphtheria		5		39	1	6	2			53
Dysentery (bacillary)				20		16	1		4	41
German measles				24	9	1	1	1	9	45
Influenza		3	2		14	3			14	36
Measles			26	38	24	16	2	3	17	126
Meningitis, meningococcus		1	1	1	2	1				6
Mumps		1		59	28	9	1	25	14	137
Poliomyelitis		1		3	17	7	4	3		35
Scarlet fever		16	18	86	62	20	2	16	20	240
Tuberculosis (all forms)		1	6	129	29	7		10	61	233
Typhoid and paratyphoid fever			4	16	4	1		1		26
Undulant fever				1						1
Venereal diseases										
Gonorrhea	3	30	9		73		33	36	37	256
Syphilis	1	19	9		71	13	9	19	13	154
Whooping cough		15	1	61	22	8	3	12	16	138

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Algeria.—Plague has been reported in Algeria as follows: Algiers, October 1–10, 1944, 5 cases; Maison Carree—September 21–30, 1944, 1 case, October 1–10, 1944, 2 cases.

Belgian Congo—Stanleyville Province—Blukwa region.—During the week ended September 30, 1944, 2 cases of plague were reported in Blukwa region, Stanleyville Province, Belgian Congo.

Madagascar.—For the period September 11-20, 1944, 4 cases of plague were reported in Madagascar.

Palestine—Plague-infected rats.—For the period June 20 to August 31, 1944, a total of 84 plague-infected rats were reported in Palestine, including 4 plague-infected rats taken from an unnamed vessel in the port of Haifa.

Senegal.—For the period September 11–20, 1944, 8 cases of plague with 7 deaths were reported in Senegal.

Smallpox

Panama (Republic)—Chiriqui Province.—For the month of September 1944, 1 case of smallpox was reported in the Province of Chiriqui, Republic of Panama.

Typhus Fever

Algeria.—For the period October 1–10, 1944, 8 cases of typhus fever were reported in Algeria.

Egypt.—For the week ended September 23, 1944, 31 cases of typhus fever with 4 deaths were reported in Egypt.

Guatemala.—For the month of September 1944, 117 cases of typhus fever with 15 deaths, were reported in Guatemala. Departments reporting the highest incidence are: Alta Verapaz, 32 cases, 3 deaths; Chimaltenango, 16 cases, 1 death; El Quiche, 16 cases, 1 death; Quetzaltenango, 31 cases, 5 deaths.

Hungary.—For the week ended September 23, 1944, 9 cases of typhus fever (including 1 case in Subcarpathia) were reported in Hungary.

Peru.—During the month of August 1944, 79 cases of typhus fever were reported in Peru. Departments reporting the highest incidence are: Arequipa, 14 cases; Cuzco, 28 cases; Puno, 11 cases.

Slovakia.—For the 2 weeks ended August 12, 1944, 3 cases of typhus fever were reported in Slovakia.

Yellow Fever

Venezuela—Tachira State—Riecito.—According to information dated October 16, 1944, 1 case of yellow fever was reported in Riecito, near Colon, Tachira State, Venezuela. Vaccination is being administered.

COURT DECISIONS ON PUBLIC HEALTH

Venereal disease—vagrancy charge held insufficient basis for reasonable suspicion of infection.—(Alabama Supreme Court; *State* v. *Hutchinson*, 18 So.2d 723; decided June 29, 1944.) In a habeas corpus proceeding the essentials of an agreed statement of facts were as follows: The petitioner was arrested by the sheriff of Houston County, Ala., and confined in the county jail; the charge against him was vagrancy and his appearance bond was fixed at $300; before a bond was presented

by the petitioner, the sheriff received an order of detention from the county health officer; after receiving such order the sheriff had presented to him by the petitioner and took and approved an appearance bond but continued to detain the petitioner in the county jail solely because of the health officer's order; as soon as the detention order was issued the health officer promptly proceeded to examine the petitioner for venereal diseases, taking blood specimens and doing such other things as were necessary to complete an examination; after such examination it was necessary for the health officer to send certain specimens of petitioner's blood for examination by the State department of health as there weie no local facilities for conducting such examination; the said specimens were promptly forwarded to the State health department but the results of the department's examination had not been obtained because a reasonable time had not elapsed within which to report the results; the sheriff's position was that there was no State law permitting the petitioner to make bond in the circumstances involved and that he had to hold the petitioner in custody and confine him to the county jail until he was ordered released by the county health officer.

The lower court granted the writ of habeas corpus and the State appealed. The Supreme Court of Alabama held that the petitioner was entitled to his discharge because the State statutes did not authorize his detention under the agreed statement of facts. One of the statutes referred to by the appellate court provided that "whenever or wherever apprehended, prostitutes and other persons whom the county health officer has probable cause to believe infected with a venereal disease shall be examined for said infection by the health officer or his assistant " However, the court pointed out that in the instant case the petitioner was arrested on a charge of vagrancy, that in defining vagrants the statute listed 13 different classes of persons as such, but that at most only 2 or 3 of the classes named were persons of whom it could be said that there were reasonable grounds to suspect that they were affected with a contagious or infectious disease. "In other words," said the court, "a charge of vagrancy alone is not enough upon which to rest a reasonable suspicion that the person arrested is affected with a contagious or infectious disease." Nowhere in the statutes, according to the court, was it provided that a person suspected of having a contagious or infectious disease could be confined in jail. It was not even provided that one so infected could be confined in jail except in the case of a venereally infected person who refused to take and continue treatment.

The order or judgment of the lower court granting the writ was affirmed.

Venereal diseases—quarantine—statutory provisions upheld.—(Texas Court of Criminal Appeals; *Ex parte James*, 181 S. W. 2d 83; decided May 10, 1944, rehearing denied June 21, 1944.) The relator in her application for a writ of habeas corpus alleged that she was being illegally confined and restrained of her liberty by the chief of police of the city of Beaumont. The record showed that she was held by virtue of a warrant of arrest and quarantine alleging that she was afflicted with a communicable disease. This warrant was issued out of the office of the city health officer as provided by article 4445 of the Revised Civil Statutes of Texas which dealt with measures for the control and prevention of the spread of venereal diseases. The lower court denied the relief sought and the relator appealed to the Texas Court of Criminal Appeals.

From the briefs filed in behalf of the appellant it was apparent, according to the appellate court, that reliance was had upon the contention that article 4445 was unconstitutional. The court said that it recognized the force of the argument made but felt that the decisions of that court and others on the subject had been overlooked and that the question had been definitely settled upon many occasions and with good reasoning supported by authorities of other States "in which the police power of the State was of necessity extended to the question involved in no uncertain manner." The Government's right to quarantine against communicable diseases was stated to be as vital to human existence as the law of self-defense. "The right has been upheld and the legislation construed to meet the emergencies of the diseases named in the legislation." The court could not agree that other provisions of the State constitution might destroy this power.

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UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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LABORATORY METHOD OF DETERMINING THE POTENCY OF TYPHOID VACCINE [1]

By JAMES J. GRIFFITTS, *Passed Assistant Surgeon, United States Public Health Service*

The antigenic properties of *E. typhosa* have been examined closely since Grinnell (*1*), in 1932, demonstrated that smoothness of vaccine-producing strains was an essential quality for the protection of mice against virulent typhoid bacilli. Perry, Findlay, and Bensted (*2*, *3*) confirmed this finding and stressed virulence as a requisite quality of the vaccine strain and, in 1934, Felix and Pitt (*4*) described Vi antigen which had been found to be a constituent of typhoid bacilli which were virulent for mice. Extensive studies at the Research Laboratories of the United States Army Medical School (*5*) resulted in the selection of a highly virulent, fully protective strain for vaccine production. This strain, No. 58 (Boxill, chronic carrier, Panama strain), replaced the older "Rawlings" strain as the source organism of typhoid vaccines in the United States.

These developments cast serious doubt on the validity of the existing potency test for typhoid vaccine, a procedure based on the production of agglutinins in rabbits by the injection of vaccine. This test was a measure of the "H" agglutinin content of serum, a value which has been shown to have little or no correlation with the ability of such serum to protect animals (*3*, *6*). Emphasis was placed on methods by which vaccines were assayed on the basis of their ability to protect animals.

Using the mucin technique described by Rake (*7*), the Research Laboratories of the United States Army Medical School developed a serum protection test in mice whereby protective antibodies were readily demonstrated in human serums after the injection of typhoid vaccine. The suspension of living typhoid bacilli in 5 percent mucin permitted the use of a range of test doses from 1 to 100,000 or more mouse lethal doses in evaluating serums. Previously the range of

[1] From Biologics Control Laboratory, National Institute of Health.

challenge doses in active or passive immunization tests was limited by the large numbers of bacilli required to kill mice. Twenty-five to 50 million virulent organisms suspended in saline represented one lethal dose for mice, and multiples of this dose often were extremely toxic. Henderson (*8*) suggested that anti-invasive properties of serum were better measured by the less toxic dose, i. e., smaller numbers of organisms in mucin, and that massive test doses of bacilli suspended in saline measured antitoxic properties of serum.

Evaluation of the potency of vaccine by passive protection tests had two theoretical objections: (1) that important factors contributing to the immune status of actively immunized animals were not subject to study by serum protection tests, and (2) that passive tests, requiring a source for immune serum, introduced into the test a second animal variable.

Active immunization procedures described by Perry and others (*3*, *5*) employed as a challenge dose large numbers of organisms in saline and were subject to the same objection Henderson raised to passive immunity tests, in that larger numbers of organisms were not well fitted to measure anti-invasive immunity. An adaptation of the mucin technique for measuring the ability of typhoid vaccines to actively immunize mice and some factors influencing this procedure are herewith presented.

MATERIALS AND METHODS

Mice. - Three strains of white Swiss mice were used: National Institute of Health, regular, National Institute of Health, brother and sister mating, and CFW. In addition, the susceptibility to typhoid bacilli of albino mice of the agouti crossed strain (ABC–AL), C3H (brown), and C57 (black) strains was examined.

Mucin.—Five percent mucin suspension was prepared as follows: 100 gm. of granular mucin were suspended in 2,000 cc. of distilled water in a large flask. To promote solution the material was heated in a water bath at 57° C. for 1 hour. This viscid suspension was filtered through several layers of gauze and brought to pH 7.2–7.4 with 0.1 N. sodium hydroxide using bromthymol blue as an indicator. The suspension, apportioned in 100 cc. amounts into small flasks, was autoclaved at 15 pounds pressure for 30 minutes. Mucin suspensions were satisfactory for at least 6 months when stored at 5° C.

Test organisms.—Strains of *E. typhosa* suspended in sterile milk were dried in vacuo from the frozen state. A fresh vial was opened on the day before test, the dried culture emulsified with sterile broth, and immediately transferred to meat infusion broth. After 2 hours' incubation at 37° C. a loopful of culture was spread on meat infusion

agar. Growth resulting after 16 to 20 hours at 37° C. was washed from the agar with physiological salt solution, and a suspension prepared having a turbidity equal to 500 parts per million of the silica standard (*9*). From this basic suspension serial tenfold dilutions in saline were made. Test doses were prepared using 5 percent mucin as the diluent in the final tenfold dilution. Pour plate colony counts were made from the 10^{-7} saline dilution. All challenge doses were given intraperitoneally in 0.5-cc. volumes. For convenience this factor of the 0.5-cc. dose was ignored in the tables presented, thus the 10^{-3} dilution actually was equal to 5×10^{-4}, 10^{-4} was equal to 5×10^{-5}, etc. Mice were observed for 72 hours. Strains of *E. typhosa* used were:

(1) *Number 63* – A typical virulent typhoid bacillus obtained from the United States Army Medical School. This organism is not used in the production of typhoid vaccine by licensed producers. In most of these studies, Number 63 was used as the challenge organism.

(2) *Number 26*.—A virulent strain which has been on laboratory media for at least 10 years.

(3) *Number 23*.—A strain isolated in 1942 which was dried after but few transfers on laboratory media.

Vaccines.—Vaccines were prepared with strain No. 58 (obtained from the United States Army Medical School) and with strain No. 24 (Rawlings strain). The technique described by Holt and Hitchens (*10*) was followed except that the suspensions were diluted with normal saline instead of buffered salt solution.

Alcohol-killed and alcohol-preserved vaccines were prepared, as recommended by Felix (*11*), with strain 58. Other vaccines used in the comparative tests were prepared by licensed laboratories. All vaccines contained 1,000 million organisms per cc. They were proved to be sterile before use. Vaccines were diluted with normal saline when necessary and mice were given doses in 0.5 cc. volume.

Fifty percent end point determinations.—In the calculation of values for protection induced in mice by vaccines, and in determining the lethal dose of the test strain, the 50 percent end point mortality method of Reed and Muench (*12*) was applied.

Rabbit serum.—Two normal rabbits weighing 5 to 6 kg., were given 3 doses (0.5, 1.0, and 1.0 cc. at weekly intervals) of each of 10 undiluted vaccines by the subcutaneous route. One week after the last dose the animals were bled and serums of each pair pooled. These serums were used in comparative, passive protection tests (table 9) (a) by determining the number of lethal doses resisted by mice given 0.1 cc. of serum 1 hour before test (*5*), and (b) by determining the least dose of serum which protected mice against a constant challenge dose of organisms. An illustrative protocol of these procedures is shown in table 1.

TABLE 1.—*Amount of serum of immunized rabbits necessary to protect 50 percent of mice against* E. typhosa

Vaccine used to immunize rabbits	Dose of serum (cc.)	Number of mice	Survivors	Deaths	Accumulated totals: Survivors	Accumulated totals: Deaths	Accumulated totals: Mortality (percent)	Calculated 50 percent end point of serum
Vaccine "F"	0.006	10	1	9	1	15	93.7	0.025 cc.
	0.025	10	5	5	6	6	50.0	
	0.1	10	9	1	15	1	6.3	
Vaccine "X"	0.006	10	5	5	5	9	64.3	0.013 cc.
	0.025	9	7	2	12	4	25.0	
	0.1	10	8	2	20	2	90.9	
Control (normal rabbit serum)	0.1	10	0	10				Greater than 0.1 cc.

Test organism: Strain 63.
Test dilution: 10^{-4}=32,000 lethal doses.
Mice: Regular strain, 18–20 gms.

Agglutination tests of rabbit serums were made using living antigens. "O" agglutinins were measured with suspensions of strain NIH 730 (901 O), and "H" agglutinins with strain NIH 729 (901–H). Approximately 400 million organisms per cc. were contained in the antigen-serum mixture. The results were read at 2 and at 24 hours after incubation at 37° C., and the greatest dilution showing macroscopic agglutination with definitely less cloudiness of the supernatant as compared to saline controls was recorded as the positive end point. Vi agglutinin titers were determined with suspensions of *S. ballerup* (*13*). Tests were read after incubation for 2 hours at 37° C. and after an additional 22 hours at +5° C. Before vaccine was injected into the rabbits their serums were negative for agglutinins against "O," "H," or Vi antigens when diluted 1:10.

FACTORS INFLUENCING RESULTS OF POTENCY TESTS

1. MICE

(*a*) *Strains of mice.*— White Swiss mice of the National Institute of Health, regular; National Institute of Health, brother and sister mating; and CFW strains were susceptible to the typhoid bacillus, as were the albino ABC–AL, C3H (brown), and C–57 (black) strains of mice. However, as shown in table 2, considerable variation in susceptibility to the test organism was present among strains of mice, and these differences influenced the numbers of lethal doses mice were enabled to resist by vaccination.

The number of immunized mice surviving the 10^{-3} test dose was not appreciably different among the four strains of mice. However, since this dose represented almost ten times as many lethal doses for the CFW strain as for the regular strain, the number of 50 percent lethal doses resisted is greater for the CFW strain.

TABLE 2.—*Influence of strains of mice on results of vaccine potency tests*

Strain of mice	Average weight: At injection of vaccine (gm.)	Average weight: At challenge (gm.)	Results (Survivors/number mice injected): Test dilutions, Given 0.05 cc. vaccine "A": 10^{-2}	10^{-3}	10^{-4}	10^{-5}	No vaccine: 10^{-6}	10^{-7}	10^{-8}	Log of dilution 50 percent mortality	50 percent lethal dose resisted by mice given vaccine
NIH-Regular	13.5	18.3	0/10	7/10	9/10	10/10	3/10	4/10	10/10	6.889	12,700
ABC-AL	13.5	19.0	0/10	5/10	5/10	9/10	1/9	1/9	5/9	7.724	13,300
NIH-B-S	12.85	18.3	0/10	6/10	8/10	8/10	0/10	2/10	9/10	7.675	29,500
CFW	13.3	17.7	0/10	5/10	8/10	10/10	0/10	1/10	5/10	7.906	51,000

All mice 5-6 weeks old
Test organism Strain 63
Test dose given 14 days after vaccine injection

(*b*) *Age and weight of mice*.—The number of typhoid bacilli suspended in mucin required to kill 50 percent of mice 5 weeks old was smaller than the number necessary to kill 50 percent of mice 7 or 10 weeks old (table 3). The age factor also affected the number of lethal doses immunized mice resisted. Fifty percent of 10-week-old mice receiving vaccine resisted 95,000 lethal doses whereas 5-week-old mice resisted 36,000 lethal doses, the younger mice not being able to withstand the 10^{-2} test dilution.

TABLE 3.—*Influence of age of mice on results of vaccine potency test*

Age of mice	Average weight: At injection of vaccine (gm.)	Average weight: At challenge (gm.)	Results (Survivors/number of mice injected): Test dilutions, Given 0.05 cc. vaccine "A": 10^{-1}	10^{-2}	10^{-3}	10^{-4}	No vaccine: 10^{-5}	10^{-6}	10^{-7}	10^{-8}	Log of dilution 50 percent mortality	Number of lethal doses resisted by mice given vaccine
5 weeks	9.25	14.3		0/10	5/10	7/10		1/10	1/9	5/10	7.833	36,000
7 weeks	11.75	18.8	0/8	5/10	5/10	8/10	0/6	2/10	5/10	8/10	7.000	27,000
10 weeks	20.25	22.5	0/10	7/10	8/10	9/10	1/8	3/10	5/10	7/10	6.906	95,000

Test organism Strain 63
Test dose given 14 days after vaccine injection

When groups of mice of the same weights but regardless of age were examined, similar results were obtained. Healthy mice of a given weight varied little in age among the strains studied.

(*c*) *Sex of mice*.—Tests to determine the influence of sex on the susceptibility and immunizability of mice gave varying results. Differences between results obtained in male or female mice were slight and not predictable. In order to avoid this possible factor, equal numbers of the two sexes among the control and immunized animals were used in most experiments.

TABLE 4.—*Influence of the number of mice used on each test dilution on results of vaccine potency tests*

Vaccine	Test dilution	Result (Survivors/number of mice injected)						
		Number of mice in group						
		3	5	7	8	10	12	15
"Y" 0.05 cc per mouse.	10^{-2}	0/3	0/5	0/7	0/8	0/10	0/12	0/15
	10^{-3}	0/3	0/5	0/7	0/8	0/10	0/12	0/15
	10^{-4}	2/3	3/5	2/7	5/8	4/10	5/12	7/15
	50 percent end point number lethal doses resisted	>3,200	10,000	2,000	>6,200	2,000	>3,200	2,500
"X" 0.05 cc per mouse	10^{-2}	0/3	0/5	0/7	0/8	0/10	0/12	0/15
	10^{-3}	2/3	5/5	5/7	7/8	7/10	10/12	12/15
	10^{-4}	2/3	4/5	7/7	6/8	9/10	11/12	13/15
	50 percent end point number lethal doses resisted	18,000	170,000	39,000	75,000	31,000	70,000	50,000
Controls, no vaccine	10^{-6}	0/3	0/5	1/7	0/8	1/10	1/12	1/15
	10^{-7}	1/3	0/5	2/7	1/8	3/10	2/12	3/15
	10^{-8}	3/3	3/5	6/7	6/8	9/10	9/12	12/15
	50 percent end point log of dilution=1 lethal dose	7.250	7.833	7.290	7.590	7.282	7.510	7.413

Test organism Strain 63
Regular strain mice, 14–16 gm.
Tested 14 days after vaccination.

(*d*) *Number of mice on test*.—Variations in results of potency tests occurred when groups of varying numbers of mice were immunized with the same vaccines. These differences are shown in table 4. Vaccine "Y" was of low potency and in most groups of mice 50 percent end points were not reached. Results varied from 10,000 lethal dose protection when 5 mice were used to less than 2,000 lethal dose protection when 10 mice were used. Vaccine "X" was a potent vaccine and results varied from 170,000 lethal dose protection when 5 mice were used to 18,000 lethal dose protection when 3 mice were used. On the basis of results obtained when 15 mice were employed per dilution smaller groups of mice would not be expected to give as consistent results. Results were definitely more erratic when less than 10 mice per test dilution were employed.

Lots of mucin may vary in their ability to enhance the lethal action of organisms (*14*). Four lots of granular mucin were employed in tests at various times with equally satisfactory results. Likewise, mucin suspensions were satisfactory when sterilized by a single 20-minute period under 15 pounds pressure, or in the Arnold sterilizer for 30-minute periods on 3 successive days (*5*).

3. TEST ORGANISM

(*a*) *Strain.*—Strain 63 was used in tests over a 3-year period and its stability with regard to lethal action in nonimmunized mice is shown in table 5. In addition to producing consistent results in mice

TABLE 5.—*The virulence of test strain 63 when tested at different periods in nonimmunized mice*

Date	Number deaths/number mice injected			Log of dilution 50 percent mortality	Pour plate colony count—0.5 cc. of 10^{-7} dilution
	Test dilution				
	10^{-6}	10^{-7}	10^{-8}		
Sept. 2, 1941	15/15	12/15	6/15	7.680	4
Oct. 13, 1941	14/15	12/15	3/15	7.459	5
Nov. 18, 1941	12/15	11/15	6/15	7.476	80
Dec. 16, 1941	10/10	7/10	5/10	7.473	69
Jan. 6, 1942	12/12	11/12	5/12	7.793	57
Jan. 16, 1942	10/10	9/10	4/10	7.760	56
Feb. 10, 1942	13/13	11/13	3/13	7.555	45
Apr. 23, 1942	10/10	9/10	4/10	7.760	36
June 18, 1942	8/10	7/10	3/10	7.357	89
Dec. 12, 1942	7/10	4/10	2/10	6.757	41
Jan. 15, 1943	10/10	7/10	1/10	7.350	66
Feb. 9, 1943	7/8	4/8	2/8	7.166	70
July 30, 1943	8/10	5/10	2/10	7.000	7
Aug. 13, 1943	9/10	7/10	3/10	7.428	61
Sept. 15, 1943	8/10	8/10	2/10	7.377	
Oct. 14, 1943	9/10	5/10	3/10	7.185	59
Nov. 15, 1943	8/10	7/10	5/10	7.552	65
Dec. 21, 1943	7/10	8/10	5/10	7.511	58
Jan. 13, 1944	9/10	8/10	3/10	7.524	55
Feb. 12, 1944	7/9	8/10	5/9	7.685	105

Mice: Regular strain. Weight at time of test 18–20 gm.

this strain had the advantage of not being homologous with vaccine producing strains.

Two other virulent strains of typhoid bacilli (Nos. 26 and 23) were used in comparative tests (table 6) and it was apparent that vaccine made from strain 58 immunized mice against each of the three challenge organisms.

TABLE 6.—*Influence of strain of test organism on the potency of typhoid vaccine*

Challenge strain	Results (Survivors/number mice injected)							Log of dilution 50 percent mortality	Number 50 percent lethal doses resisted by mice given vaccine
	Given 0.05 cc. vaccine "A"			No vaccine					
	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}		
T23	1/9	5/9	9/9	1/10	1/10	2/10	7/9	7.383	37,000
T26	2/9	7/9	6/9	1/10	2/10	3/10	7/10	7.285	68,000
T63	1/9	4/9	5/9	0/10	2/10	3/9	4/9	7.793	23,000

Mice: Regular strain, weighing 14–16 gm. at beginning of test.
Tested 14 days after vaccine injection.

(*b*) *Number of organisms in test doses*.—Suspensions of test organisms were standardized by matching with a silica standard and the number of organisms present in the 10^{-7} dilution from the original suspension was reasonably consistent on various dates as shown by pour plate colony counts and by the calculated 50-percent lethal dose for mice (table 5).

The number of typhoid organisms used in testing the potency of vaccine in immunized mice was limited by the fact that doses containing more than approximately 50 million organisms in mucin (10^{-1} dilution) were toxic to such an extent that mice given large doses of vaccine or a dose of high titered immune rabbit serum failed to survive this severe test dose. Test doses from the 10^{-2} dilution downward were used in order to avoid this toxic factor.

4. VACCINES

(*a*) *Size of the immunizing dose.*—The size of the immunizing dose of vaccine markedly influenced the number of lethal doses mice resisted (table 7).

TABLE 7.—*Effect of dose of vaccine on the number of lethal doses resisted by mice*

Vaccine	Dose of vaccine (cc.)	Results: Number survivors/number mice injected—test dilutions								Number 50 percent lethal doses resisted
		10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	
MS	0.25	0/10	4/10	10/10	10/10					41,000
	.05		1/10	3/10	7/10	7/10				6,000
	.01			0/10	1/10	3/10	7/10	-		100
	.002				1/10	2/10	2/10	4/10		5
A	.5X2	0/10	9/10	10/10						740,000
	.25	0/10	7/10	9/9						470,000
	.05		4/9	6/9	10/10					45,000
	.01			1/9	5/10	7/9	7/10			1,000
	.002				1/10	4/10	7/10	7/10		75
	.0004				0/10	0/10	3/10	3/10	--	3
Rawlings	.5X2		0/10	0/10	0/10	3/10	8/10			100
	.25			0/10	1/9	1/9	3/9	6/9		12
	.05				1/10	1/9	3/9	4/9		7
Controls	No vaccine					0/10	1/10	3/10	7/10	(1)

[1] 50 percent lethal doses=7.432.

Mice: Regular strain, weighing 14-16 gm. Tested 14 days after vaccine injection.
Test organism: Strain 63.

A single dose of 0.25 cc. of vaccine "A" protected 50 percent of mice against several hundred thousand lethal doses, whereas 0.01 cc. failed to protect mice against the larger test doses. The relationship between amount of vaccine injected and number of lethal doses resisted by vaccinated mice did not appear to be linear. The curve was flattened in the range of the larger immunizing doses (fig. 1) and this leveling was due perhaps to limitations imposed by the toxicity of larger test doses.

Figure 1 illustrates curves obtained when numbers of lethal doses resisted by immunized mice are plotted according to the amount of vaccine injected. The curve representing Vaccine "A" illustrates that 2 doses of 0.5 cc. each, at a 7-day interval, did not cause a proportionate increase in the level of immunity over that induced in

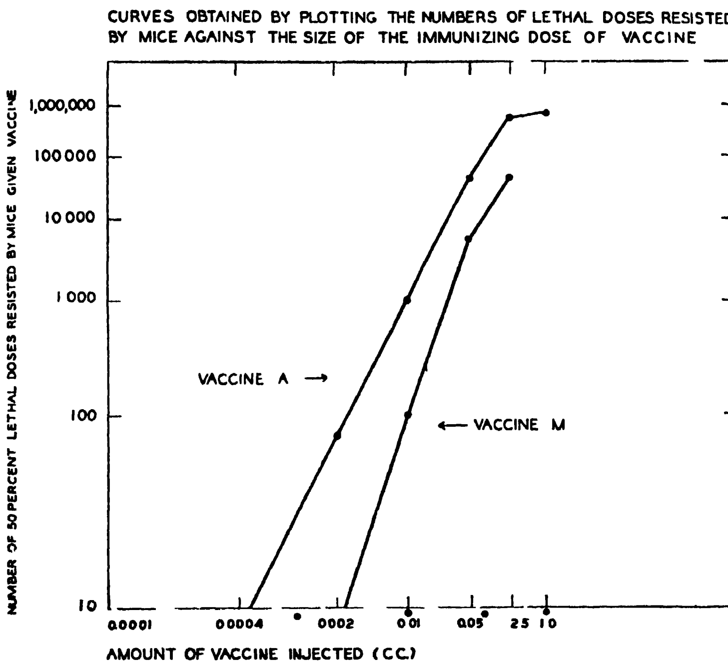

FIGURE 1. Curves obtained by plotting the numbers of lethal doses resisted by mice against the size of the immunizing dose of vaccine

mice by a single dose of 0.25 cc. of vaccine. Vaccine "M5" was one which was consistently of lower potency than vaccine "A."

(b) *Route of injection of the vaccine.*—Mice were immunized successfully with typhoid vaccine when injected subcutaneously, intravenously, or intraperitoneally. The number of lethal doses resisted by mice was greatest in the group vaccinated intraperitoneally, intermediate in the intravenously vaccinated group, and least in the subcutaneously vaccinated group.

(c) *Number of doses.*—Stimulating effects of a second or third dose of vaccine were noted among 3 groups of mice which received the same total amount of vaccine given in 1, 2, or 3 injections. Mice receiving the immunizing dose in 2 or 3 injections resisted larger test doses than those getting 1 injection of vaccine. A single injection of vaccine avoided the possible confusing effects of secondary stimulation on the results of potency tests.

5. INTERVAL BETWEEN IMMUNIZATION AND CHALLENGE

Mice exhibited immunity to the smaller test doses 1 day after vaccine was injected, as illustrated in table 8. The number of lethal doses resisted by mice was considerably greater on the third day after

TABLE 8.—*Influence of interval between injection of vaccine and challenge test on the results of potency test of typhoid vaccine*

Number of days between vaccine and test	Results Number survivors/number mice injected—test dilutions								Number of 50 percent lethal doses resisted by mice given vaccine
	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	
1		-	1/9	3/10	8/10	9/10			680
3			5/10	8/10	10/10	10/10			11,700
7	0/10	1/10	5/10	6/10					9 200
10	0/8	2/10	5/10	9/10					22 000
14	0/10	2/10	8/10	9/10					48 600
Controls (given 0 5 cc saline containing 0 25 percent tricresol 1 day before test)					0/10	3/10	4/10	6/10	

Vaccine Vaccine "A," 0 05 cc
Mice Regular strain, weighing 14–16 gm. at injection
Organism Strain 63

immunization Results obtained on the third and on the seventh days were not significantly different. Tests at 10 and 14 days after the injection of vaccine gave consistently higher values than at the 7-day interval.

COMPARISON OF VACCINES BY VARIOUS METHODS OF TESTING

Anti-invasive properties produced in mice by the injection of typhoid vaccine were measured quantitatively by two methods (1) Mice given a constant dose of vaccine (0.05 cc. of the finished vaccine) were tested with various dilutions of the test organism, in which instance the result was expressed in numbers of lethal doses mice were enabled to resist; (2) groups of mice given varying amounts of vaccine were challenged with a constant test dose of organisms, and results were expressed as the least amount of vaccine necessary to protect mice against a specified challenge dose of organisms. The evaluation of 10 vaccines by these two methods gave comparable results as to the relative potency of each vaccine as an immunizing agent (table 9).

The same vaccines were injected into rabbits, and the serums of these animals were used in 2 types of passive protection tests. Results of passive immunity tests did not agree with the values assigned the vaccines by active immunization tests. Vaccine "B" made from the

TABLE 9.—*Comparative tests of potency of 10 vaccines*

Vaccine	Description of vaccine	Active immunization tests				Passive immunization tests (serums of vaccinated rabbits)				Agglutinin titer of serums of rabbits given vaccine		
		Number 50 percent lethal doses resisted by mice given 0 05 cc of vaccine		Amount vaccine required to protect 50 percent of mice against 10 000 lethal doses of *E typhosa*		Number 50 percent lethal doses resisted by mice given 0 1 cc of serum		Amount serum required to protect 50 percent of mice against 10 000 lethal doses of *E typhosa*		O	H	Vi
		Number lethal doses resisted	Relative potency [1]	Amount of vaccine (cc)	Relative potency [1]	Number lethal doses resisted	Relative potency [1]	Amount of serum (cc)	Relative potency [1]			
A	Prepared at NIH, strain 58, heat killed tricresol preserved	40 000	100	0 005	100	224 000	100	0 05	100	400	3200	10
B	Prepared at NIH, Rawlings strain, heat killed tricresol preserved	([2])	0 025	25	2	24,000	10	06	80	400	3200	10
C	Commercial	1 000	2 5	05	10	100 000	45	015	330	800	3200	20
D	Commercial	1 100	3 6	035	15	175 000	80	055	90	1600	3200	20
E	Commercial	5 500	14 0	025	20	265 000	120	025	200	800	1600	10
F	Commercial	13 000	30 0	008	68	269 000	120	025	200	1600	3200	10
G	Prepared at NIH, strain 58, killed with 75 percent alcohol, preserved with 22 5 percent alcohol	88 000	220	002	250	147 000	65	017	300	800	1600	10
H	Commercial	19 000	51	022	25	317 000	140	014	350	800	3200	10
I	Commercial	17 000	40	03	21	127 000	57	014	350	800	1600	2
J	Commercial	400	10	05	10	100 000	45	04	120	1600	3200	20

[1] Value arbitrarily assigned to vaccine 'A'—100
[2] Less than 10

Rawlings strain gave the lowest value on active or passive tests, yet marked differences between this and other vaccines were demonstrated by the active immunization tests. It was evident also that vaccine "G," having the highest value in tests of active immunity, was mediocre in passive immunity tests. A possible explanation of this finding was that other immunity factors contributed to the protection of actively immunized mice while in passive protection tests serum antibody levels alone were being measured.

The "O" agglutinin titers of the rabbit serums were not in agreement with results of either active or passive tests of the efficacy of vaccines except that the "O" titer of rabbits given vaccine "B" (Rawlings strain) was low. All vaccines produced relatively high "H" agglutinin titers, and the lack of significance of this titer in relation to protective ability was indicated by the high value produced by the Rawlings strain of vaccine. The "H" titers indicated in the table corresponded to values obtained by tests which were formerly used to determine potency of typhoid vaccine.

Agglutinins for *S. ballerup* (Vi) were produced in low titer by all vaccines without any correlation to ability of serums to protect mice. The low Vi titers obtained, even with the alcohol-killed vaccine, agreed with the finding of Felix that vaccines given subcutaneously fail to raise Vi agglutinins in rabbits.

Of the vaccines examined, vaccine "G" (made with strain 58 according to the method recommended by Felix (*11*) in which alcohol was used to kill the organisms) gave very high values on active immunization tests. Vaccine "G" and vaccine "A" were products of the same lot of vaccine, differing only in the agents used in killing and preserving the organisms.

DISCUSSION

The potency of typhoid vaccines as measured by active immunization of mice is influenced by a number of factors. In order that potency tests at various times and in different laboratories may be comparable several parts of the test procedure should be standardized. The use of a stable standard vaccine to be used in immunizing mice concurrently with the assay of vaccine of unknown potency would appear to be indicated for the control of the variable factors of the test. At the present time no such standard exists and it therefore becomes important to attempt to control factors known to influence the results of potency tests.

The strain of mice used should be fully susceptible to *E. typhosa* since the number of lethal doses resisted by immunized mice is influenced by the susceptibility of mice. The age and weight of mice should be uniform and, although differences in the sex of mice ap-

peared to be slight, this factor may influence the results. A sufficient number of mice should be used to give consistent results.

The test organism should be virulent for mice and the basic suspension of organisms should contain approximately the same number of organisms for each test. Furthermore, cultures of a definite age should be used in order to obtain uniformity of results.

Due to the inability of mice to tolerate large toxic doses of organisms, it is difficult to demonstrate differences in the potency of vaccines when doses of 0.25 cc. or more of vaccine are given mice. Smaller doses of vaccine produce immunity in mice below the level at which the toxic doses need to be used to demonstrate protection. Differences in the potency of vaccine can be shown with small immunizing doses. The vaccine should be given in one dose to avoid the effect of the secondary stimulation, and it should be given by the same route in all tests. A definite time interval between injection of vaccine and challenge with typhoid bacilli should be established.

SUMMARY

The ability of typhoid vaccine to immunize mice against typhoid bacilli may be measured quantitatively. A suggested procedure for measuring the potency of typhoid vaccine, in which factors influencing the results of tests are thought to be minimized, follows:

Each of 30 or more mice of any susceptible strain, 6–8 weeks old and weighing 14–16 gms., is given 0.5 cc. of a 1:10 dilution of the vaccine intraperitoneally. Equal numbers o male and female mice should be used in each group. Fourteen days after the injection of vaccine the mice are divided into 3 groups of not less than 10 mice each, one group to receive approximately 100,000, one group approximately 10,000, and the third group approximately 1,000 lethal doses of virulent typhoid bacilli (16–20 hours old) suspended in 5 percent mucin.

At the time of the challenge, not less than 30 mice (set aside at the time of injecting mice with vaccine) of the same strain, age, weight, and equally distributed as to sex, are divided into 3 groups of not less than 10 mice each. These groups are given doses of typhoid organisms suspended in mucin so that in one group the majority of mice die, in another the majority survive. These mice serve to determine the lethal dose which shall be the greatest dilution which kills 50 percent or more of mice tested. Pour plate colony counts are made to determine the number of organisms present, and in this fashion the virulence of the test organism is checked. The virulence of a test strain should be such that not over 100 organisms suspended in mucin are required to kill 50 percent of mice. All challenged mice should be observed for 72 hours.

The requirement that 0.05 cc. of vaccine protects at least 50 percent of mice against not less than 10,000 lethal doses should be established.

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THE ISOLATION OF A FILTER-PASSING AGENT FROM THE RABBIT TICK *HAEMAPHYSALIS LEPORIS-PALUSTRIS* PACKARD [1]

By EDWARD A. STEINHAUS, *Associate Bacteriologist*, and R. R. PARKER, *Director, Rocky Mountain Laboratory, United States Public Health Service*

In connection with the study of certain tick-borne disease agents in southern Texas, two strains of an unidentified filter-passing agent, presumably a virus, were isolated from 2 separate lots of rabbit ticks,[2] *Haemaphysalis leporis-palustris*, collected in July 1943 in connection with a study of infectious agents resident in the tick population of Camp Bullis, near San Antonio, Tex., being made by the United States Public Health Service at the request of the Surgeon General's Office

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[1] Contribution from Rocky Mountain Laboratory of the Division of Infectious Diseases, National Institute of Health

[2] The rabbit ticks from which this disease agent was recovered were collected by Principal Sanitary Technician James M. Brennan, of the Office of the Post Surgeon, Col. Robert H. Duenner, Fort Sam Houston, Tex.

of the United States Army. Strain No. 1 was isolated from a lot of 1 nymph and 32 adult ticks injected subcutaneously and intradermally into a guinea pig. Strain No. 2 was similarly isolated from a lot consisting of 36 adults and 10 nymphs. Three other small lots tested from this area gave negative results.

Guinea pigs, mice, and rabbits were susceptible to the agent, though of the three animals, the guinea pig appeared to give the most distinct reaction. This animal was susceptible when inoculated subcutaneously, intraperitoneally, intracerebrally, or when infectious material was given orally. After an incubation period of 4 to 10 days, infected guinea pigs usually showed a fever for 2 to 6 days with temperatures varying from 39.6° to 40.4° C. The infection was never fatal, and, when sacrificed at the height of the fever, the autopsied animals showed very little gross evidence of disease. In fact, the only consistent finding was an enlargement of the spleen to about one and one-half to three times its normal size. Peculiar raised areas were observed frequently on the surface of the spleen. Occasionally there was some involvement of the inguinal and axillary lymph nodes.

Several "legs" of the 2 strains were maintained in guinea pigs for 9, 11, 13, 16, 17, and 23 consecutive transfers.

No cross immunity was noted between this agent and those of Rocky Mountain spotted fever or American Q fever.

Attempts to cultivate the agent on artificial media (North's gelatin chocolate blood agar, cystine-heart-agar, and Noguchi's leptospira medium) were unsuccessful. On the other hand, it was maintained in fertile hen's eggs for eight passages, killing up to 50 percent of the embryos. The agent grown in eggs was filterable through Seitz and Berkefeld filters.

Smears of animal and egg tissues revealed no recognizable organism when stained by Gram's, Macchiavello's, or Giemsa's staining methods.

DEATHS DURING WEEK ENDED OCTOBER 28, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 28, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8,998	8,932
Average for 3 prior years	8,568	
Total deaths, first 43 weeks of year	386,218	393,647
Deaths under 1 year of age	629	651
Average for 3 prior years	642	
Deaths under 1 year of age, first 43 weeks of year	26,669	28,455
Data from industrial insurance companies		
Policies in force	66,836,251	65,993,7[illegible]0
Number of death claims	13,211	12,418
Death claims per 1,000 policies in force, annual rate	10.3	9.8
Death claims per 1,000 policies, first 43 weeks of year, annual rate	10.0	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 4, 1944

Summary

Although continuing the decline interrupted only once in the past 8 weeks, the current incidence of poliomyelitis, 451 cases, is above that for any corresponding week since 1930. Increases occurred in only 4 of the 11 States reporting more than 9 cases each, as follows (last week's figures in parentheses): *Increases*—Ohio 31 (25), Michigan 24 (19), Missouri 13 (12), California 17 (15); *decreases* - New York 145 (182), New Jersey 17 (30), Pennsylvania 34 (36), Illinois 23 (27), Minnesota 12 (24), Maryland 16 (17), North Carolina 18 (21). The total for the year to date is 17,888, as compared with a 5-year median of 8,170, and 11,379 for the same period last year, which was 91 percent of the total for that year.

Of the total of 145 cases of meningococcus meningitis, New York reported 18, Pennsylvania and Ohio 15 each, and California 9. The cumulative total to date is 14,626, as compared with 15,573 last year and a 5-year median of 1,735 for the corresponding periods.

A total of 2,474 cases of scarlet fever was reported during the current week, as compared with a 5-year median of 2,556 and last week's total of 2,412. The latter figure is the only weekly total recorded since August that was above the respective 5-year median.

The current figure for influenza, 1,612, as compared with last week's total of 1,549 and a 5-year median of 1,429, is slightly above the total for any corresponding week of the past 5 years. The cumulative total since the week ended August 12, the week of lowest incidence this year, is 11,065, as compared with 11,493 for the same period last year and a 5-year median of 10,781.

Current reports of diphtheria, measles, smallpox, typhoid fever, and whooping cough are below the respective 5-year medians.

Deaths recorded for the week in 91 large cities of the United States totaled 8,902, as compared with 8,929 last week and 8,450 for the 3-year (1942–43) average. The cumulative total to date is 391,861, as compared with 399,120 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended November 4, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria Week ended— Nov. 4, 1944	Diphtheria Week ended— Nov. 6, 1943	Diphtheria Median 1939–43	Influenza Week ended Nov. 4, 1944	Influenza Week ended Nov. 6, 1943	Influenza Median 1939–43	Measles Week ended— Nov. 4, 1944	Measles Week ended— Nov. 6, 1943	Measles Median 1939–43	Meningitis, meningococcus Week ended Nov. 4, 1944	Meningitis, meningococcus Week ended Nov. 6, 1943	Meningitis, meningococcus Median 1939–43
NEW ENGLAND												
Maine	0	1	1	1	1		3	64	[illegible]	0	3	0
New Hampshire	0	0	0				0	16	2	0	1	0
Vermont	0	0	0				1	19	19	0	1	0
Massachusetts	[illegible]	2	[illegible]				[illegible]	1[illegible]7	16	8	7	2
Rhode Island	2	3	1	19			0	22	10	0	1	1
Connecticut	3	1	1	1	—	2	18	14	14		2	1
MIDDLE ATLANTIC												
New York	9	9	13	[1]	[1] 4	4	23	13	135	18	42	2
New Jersey	1	1	[illegible]			6	12	182	19	[illegible]	8	1
Pennsylvania	[illegible]	8	13		3	1		143	143	1[illegible]	14	3
EAST NORTH CENTRAL												
Ohio	12	1[illegible]	21	—	2	11	11	86	34	15	9	2
Indiana	4	32	22	2	12	12	3	80	10	2	[illegible]	2
Illinois	3	9	2	1	2	8	8	39	38	8	14	1
Michigan	18	10	7	3	1	2	13	232	127	4	5	1
Wisconsin	9	4	2	[illegible]	12	24	11	334	110	6	2	1
WEST NORTH CENTRAL												
Minnesota	2	9	1	1			[illegible]	407	9	5	2	1
Iowa	1[illegible]	8	8			1	1	17	25	2	0	0
Missouri	3	3	5				1	6	5		1	1
North Dakota	[illegible]	1	2		4		1	109	4	0	0	0
South Dakota	—	7	3				3	68	4	0	0	0
Nebraska	0	3	3		1	1	4		3	1	1	0
Kansas	2	9	[illegible]	2	1	2	5	2	5	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0				1	12	3	0	1	0
Maryland [2]	2	7	6	1	2		1	14	14	5	6	0
District of Columbia	0	0	1				2	5	0	2	[illegible]	0
Virginia	1[illegible]	13	2[illegible]	80	11	70	5	214	20	1	4	1
West Virginia	6	8	10		2	6	3	30	[illegible]	1	2	1
North Carolina	27	29	6[illegible]	15	9	2	6	41	41	3	3	0
South Carolina	10	19	28	357	272	293	3	63	3	[illegible]	1	1
Georgia	29	25	2[illegible]	50	25	2[illegible]	2	11	2	0	1	1
Florida	17	8	8	2	3	3	11	26	3	2	2	0
EAST SOUTH CENTRAL												
Kentucky	12	12	16		5	5	0	5	14	2	7	2
Tennessee	8	16	16	1	30	14	3	8	8	0	2	1
Alabama	35	11	23	27	61	42	1	2[illegible]	5	3	3	1
Mississippi [2]	28	12	14							3	5	1
WEST SOUTH CENTRAL												
Arkansas	27	[illegible]	19	66	11	31	6	2	2	2	0	0
Louisiana	17	6	14		[illegible]	3	1	2	1	1	5	0
Oklahoma	20	[illegible]	15	[illegible]7	17	31	9	14	1	1	1	0
Texas	63	46	47	785	638	602	29	34	28	7	9	2
MOUNTAIN												
Montana	2	1	0	5	4	4	2	57	19	1	0	0
Idaho	3	0	0				3	0	[illegible]	0	0	0
Wyoming	2	0	0		4	4	3	7	4	0	0	0
Colorado	3	5	5	29	21	14	11	32	[illegible]4	0	1	0
New Mexico	8	0	0	1			0	1	2	0	0	0
Arizona	4	2	4	60	113	68	0	8	8		2	0
Utah [2]	0	0	0			3	11	6	6	0	0	0
Nevada	0	0	0	2			2	9	0	0	1	0
PACIFIC												
Washington	20	3	5				11	26	26	1	4	2
Oregon	9	0	0	5	17	17	42	22	22	1	5	2
California	22	35	18	20	22	27	191	53	53	9	7	2
Total	518	403	619	1,612	1,429	1,429	569	3,162	1,771	147	193	33
44 weeks	10,752	11,115	12,632	349,179	92,654	157,887	596,558	554,188	476,152	14,628	15,573	1,735

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended November 4, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis: Week ended— Nov. 4, 1944	Poliomyelitis: Week ended— Nov. 6, 1943	Poliomyelitis: Median 1939–43	Scarlet fever: Week ended— Nov. 4, 1944	Scarlet fever: Week ended— Nov. 6, 1943	Scarlet fever: Median 1939–43	Smallpox: Week ended— Nov. 4, 1944	Smallpox: Week ended— Nov. 6, 1943	Smallpox: Median 1939–43	Typhoid and paratyphoid fever[3]: Week ended— Nov. 4, 1944	Typhoid and paratyphoid fever[3]: Week ended— Nov. 6, 1943	Typhoid and paratyphoid fever[3]: Median 1939–43
NEW ENGLAND												
Maine	2	0	0	21	19	12	0	0	0	0	0	1
New Hampshire	1	2	1	7	9	7	0	0	0	0	0	0
Vermont	0	0	0	6	8	3	0	0	0	0	0	0
Massachusetts	8	8	3	107	140	140	0	0	0	2	3	2
Rhode Island	0	3	0	7	9	4	0	0	0	0	1	0
Connecticut	8	5	0	23	30	30	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	145	16	16	185	213	178	0	0	0	8	3	5
New Jersey	17	3	4	43	48	62	0	0	0	2	2	3
Pennsylvania	34	4	8	161	183	166	0	0	0	3	2	8
EAST NORTH CENTRAL												
Ohio	31	2	9	226	290	227	0	0	0	4	2	6
Indiana	5	1	2	62	72	51	0	1	1	1	1	2
Illinois	23	23	20	128	127	186	0	0	0	4	1	2
Michigan[2]	24	7	11	144	118	118	2	1	1	0	2	3
Wisconsin	7	8	5	78	152	125	1	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	12	7	7	46	94	68	0	0	0	0	0	0
Iowa	6	2	2	40	61	55	0	1	1	2	0	0
Missouri	13	2	2	31	46	48	0	0	0	3	2	5
North Dakota	0	1	0	9	11	12	0	0	1	0	0	0
South Dakota	0	1	1	19	19	19	0	1	1	0	0	0
Nebraska	1	3	4	2[illegible]	23	15	0	0	0	0	0	0
Kansas	4	8	4	93	80	60	0	2	1	2	1	1
SOUTH ATLANTIC												
Delaware	2	0	0	0	2	6	0	0	0	0	0	0
Maryland[2]	16	0	1	58	54	44	0	0	0	0	1	5
District of Columbia	0	0	0	20	9	10	0	0	0	1	0	0
Virginia	8	1	1	61	72	53	0	0	0	1	11	5
West Virginia	4	1	2	80	70	70	0	0	0	3	0	3
North Carolina	18	1	1	106	159	102	0	0	0	4	0	4
South Carolina	1	2	1	18	11	17	0	0	0	1	2	3
Georgia	3	0	0	37	30	30	0	0	0	0	9	7
Florida	4	1	1	8	13	7	0	0	0	1	6	3
EAST SOUTH CENTRAL												
Kentucky	9	2	5	48	68	64	0	0	0	5	1	11
Tennessee	2	0	0	23	59	59	0	0	0	2	1	1
Alabama	0	0	0	29	27	39	0	0	0	1	0	3
Mississippi[2]	2	0	0	20	14	14	0	0	0	2	3	1
WEST SOUTH CENTRAL												
Arkansas	0	0	2	30	8	11	0	0	0	13	1	9
Louisiana	2	3	2	17	8	8	0	0	0	4	1	4
Oklahoma	0	12	1	21	55	23	0	0	1	3	7	7
Texas	8	12	8	95	48	37	0	1	1	13	9	9
MOUNTAIN												
Montana	1	0	0	11	9	13	0	0	0	0	3	1
Idaho	0	0	0	40	16	13	0	0	0	0	0	0
Wyoming	0	0	0	5	6	5	0	0	0	0	0	0
Colorado	0	8	2	28	27	27	1	0	1	0	2	2
New Mexico	1	2	1	16	3	3	0	0	0	3	1	2
Arizona	0	1	0	7	27	2	0	0	0	1	0	1
Utah[2]	1	15	4	9	29	6	0	0	0	0	0	1
Nevada	0	0	0	1	2	1	0	0	0	0	0	0
PACIFIC												
Washington	9	15	3	42	100	39	0	0	0	1	1	1
Oregon	2	18	2	20	41	12	0	0	0	0	0	1
California	17	59	9	163	148	134	0	0	0	5	2	3
Total	451	259	259	2,474	2,860	2,556	4	7	8	95	83	159
44 weeks	17,888	11,379	8,170	162,990	116,334	116,334	340	655	1,252	4,883	4,910	7,578

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever cases reported separately as follows: Massachusetts, 2, New York, 2, New Jersey, 2, Kentucky, 3, Arkansas, 1, Texas, 1, Arizona, 1, California, 1.

Telegraphic morbidity reports from State health officers for the week ended November 4, 1944, and comparison with corresponding week of 1943 and 5-year median—Con

Division and State	Whooping cough: Week ended— Nov 4, 1944	Whooping cough: Week ended— Nov 6, 1943	Whooping cough: Median, 1939–43	Week ended Nov 4, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	17	33	27	0	0	0	0	0	0	0	0	0
New Hampshire	0	3	3	0	0	0	0	0	0	0	0	0
Vermont	47	29	22	0	0	0	0	0	0	0	0	0
Massachusetts	95	98	168	0	0	3	0	0	0	0	0	0
Rhode Island	35	35	24	0	0	0	0	0	0	0	0	0
Connecticut	76	65	80	0	0	11	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	168	254	405	0	3	75	0	0	0	1	0	0
New Jersey	77	81	129	0	20	0	0	0	0	0	0	0
Pennsylvania	104	167	330	1	1	0	0	0	0	1	0	0
EAST NORTH CENTRAL												
Ohio	138	116	124	0	0	3	0	0	0	1	1	0
Indiana	1	28	26	0	0	0	0	1	0	0	0	0
Illinois	50	130	172	0	8	0	0	2	0	0	2	0
Michigan [2]	49	122	155	0	1	4	0	0	0	0	0	0
Wisconsin	73	193	174	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	42	53	53	0	3	0	0	1	0	0	0	0
Iowa	3	35	20	0	0	0	0	1	0	0	0	0
Missouri	19	13	13	0	0	0	1	0	0	0	0	0
North Dakota	10	6	15	0	0	0	0	0	0	0	0	0
South Dakota	6	5	6	0	0	0	0	0	0	0	0	0
Nebraska	12	13	6	0	0	0	0	0	0	0	0	0
Kansas	21	35	35	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	2	4	7	0	0	0	0	0	0	0	0	0
Maryland [2]	61	34	31	0	0	0	6	0	0	0	0	0
District of Columbia	[illegible]	6	11	0	0	0	0	0	0	0	0	6
Virginia	20	101	61	0	0	0		0	0	0	0	0
West Virginia	14	16	16	0	0	0	[illegible]	0	0	0	1	0
North Carolina	57	184	103	0	0	0	0	0	0	0	0	2
South Carolina	59	51	37	0	0	4	0	0	0	0	0	10
Georgia	6	11	16	0	1	1	0	0	0	0	0	2
Florida	28	27	12	0	1	1	1	0	0	0	0	14
EAST SOUTH CENTRAL												
Kentucky	15	63	64	0	0	0	0	0	0	0	2	0
Tennessee	11	29	29	0	0	0	1	0	0	0	1	0
Alabama	15	0	19	0	1	0	0	0	0	0	0	21
Mississippi [2]				0	0	0	0	0	0	0	0	8
WEST SOUTH CENTRAL												
Arkansas	32	13	17	0	1	11	0	0	0	0	0	0
Louisiana	0	2	6	0	0	0	0	0	0	0	0	7
Oklahoma	2	1	1	0	0	0	10	1	0	0	0	0
Texas	134	44	77	0	17	655	9	0	0	0	0	47
MOUNTAIN												
Montana	44	12	7	0	0	0	0	0	0	0	0	0
Idaho	5	8	6	0	0	0	0	0	0	0	0	0
Wyoming	2	10	8	0	0	0	0	0	0	0	0	0
Colorado	2	40	31	0	0	0	0	0	0	0	0	0
New Mexico	0	0	8	0	1	0	0	0	0	0	0	0
Arizona	3	11	8	0	0	0	22	0	0	0	0	0
Utah [2]	12	12	20	0	0	0	0	0	0	0	0	0
Nevada	0	2	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	15	63	53	0	0	0	0	0	0	0	0	0
Oregon	9	40	16	0	0	0	0	0	0	0	0	0
California	94	81	185	0	2	22	0	0	0	0	0	0
Total	1 694	2 379	2 804	1	60	790	124	6	0	3	6	134
Same Week 1943	2 379			2	29	255	82	[illegible]	0	2	17	128
Same Week 1942	2 804			1	16	207	58	18	2	4	4	100
44 Weeks 1944	81 128			38	1 584	20 540	7,747	570	27	447	478	4 426
44 Weeks 1943	159 207			58	1,808	14 237	6 756	597	24	427	706	3 716
44 Weeks 1942	152,531		[4] 152,531	71	1 048	11,009	6 023	500	42	[4] 449	748	[4] 2 463

[2] Period ended earlier than Saturday

[4] 5-year median 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended October 28, 1944

This table lists the reports from 89 cities of more than 10 000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	0	1	3	0	2	0	0	1
New Hampshire												
Concord	0	0		0	0	0	1	0	0	0	0	0
Vermont												
Barre	0	0		0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	0	0		0	56	4	10	6	37	0	0	7
Fall River	0	0		0	1	0	1	0	2	0	0	0
Springfield	0	0		0	0	1	0	0	3	0	0	0
Worcester	0	0		0	1	0	13	0	11	0	0	1
Rhode Island												
Providence	0	0	1	0	1	1	4	1	7	0	0	2
Connecticut												
Bridgeport	0	0		0	0	0	1	0	0	0	0	2
Hartford	0	0		0	0	1	2	0	1	0	0	4
New Haven	0	0		0	0	0	1	2		0	0	10
MIDDLE ATLANTIC												
New York												
Buffalo	1	0	0	1	1	0	8	1	3	0	0	0
New York	11	1	4	2	7	14	54	77	72	0	3	95
Rochester	0	0		0	11	0	0	16	0	0	0	9
Syracuse	0	0		0	0	0	2	2	1	0	0	2
New Jersey												
Camden	0	0		0	0	1	1	0	0	0	0	0
Newark	0	0		0	1	0	[illegible]	1	7	0	0	4
Trenton	0	0		0	0	0	0	0	1	0	0	0
Pennsylvania												
Philadelphia	2	0	[illegible]	2	4	2	22	7	28	0	7	20
Pittsburgh	1	0	1	1	1	2	10	0	11	0	0	11
Reading	0	0		0	0	0	1	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cleveland	0	0	1	0	1	4	3	1	33	0	0	18
Columbus	1	0		0	0	0	4	0	6	0	0	4
Indiana												
Fort Wayne	0	0		0	0	0	2	0	2	0	0	0
Indianapolis	0	0		0	1	1	6	1	3	0	0	3
South Bend	8	0		0	0	0	0	0	2	0	0	1
Terre Haute	0	0		0	0	0	3	0	0	0	0	1
Illinois												
Chicago	0	0	3	0	4	8	18	12	42	0	2	26
Springfield	0	0		0	2	1	3	2	1	0	0	0
Michigan												
Detroit [1]	5	0	1	3	2	2	6	5	30	0	0	15
Flint	0	0		0	1	0	0	0	3	0	0	0
Grand Rapids	0	0		0	0	0	0	0	4	0	0	0
Wisconsin												
Kenosha	0	0		0	0	0	0	0	0	0	0	9
Milwaukee	0	1		0	4	1	3	0	12	0	0	3
Racine	0	0		0	1	0	0	0	11	0	0	8
Superior	0	0		0	0	0	0	0	1	0	0	2
WEST NORTH CENTRAL												
Minnesota												
Duluth	1	0		0	0	0	3	2	6	0	0	6
Minneapolis	12	0		0	0	0	4	10	5	0	0	5
St Paul	0	0		0	0	1	7	0	5	0	0	27
Missouri												
Kansas City	0	0		0	0	2	10	0	6	0	0	6
St Joseph	0	0		0	0	0	0	0	2	0	0	0
St Louis	1	0	5	1	1	3	11	8	4	0	0	11

See footnotes at end of table

City reports for week ended October 28, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	0	0	1	0	0	0	0	0
Nebraska:												
Omaha	2	0		0	6	0	1	0	2	0	0	2
Kansas:												
Topeka	0	1		0	0	0	1	0	7	0	0	2
Wichita	0	0		0	1	0	0	0	1	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0		0	0	0	3	3	0	0	0	0
Maryland:												
Baltimore	6	0	2	2	3	1	7	4	22	0	0	70
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	1	0	0	0	0	0
District of Columbia:												
Washington	0	0	2	0	2	2	7	6	14	0	0	6
Virginia:												
Lynchburg	0	0		0	0	1	0	5	1	0	0	0
Richmond	0	0		0	0	0	1	1	15	0	0	4
Roanoke	0	0		0	0	0	0	1	6	0	0	4
West Virginia:												
Charleston	0	0		0	0	0	0	0	4	0	0	0
Wheeling	0	0		0	0	0	1	0	3	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	0	0	1	0	0	1
Wilmington	0	0		0	1	0	0	0	[illegible]	0	0	0
Winston-Salem	0	0		0	2	0	2	0	4	0	0	3
South Carolina:												
Charleston	0	0	6	0	0	0	[illegible]	1	2	0	0	0
Georgia:												
Atlanta	0	0		0	0	0	2	2	6	0	0	3
Brunswick	0	0		0	0	0	2	0	1	0	0	0
Savannah	0	0	3	3	0	0	1	0	0	0	0	0
Florida:												
Tampa	4	0		0	0	0	2	0	2	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	2	1	4	1	13	1	13	0	0	9
Nashville	0	0		1	0	0	5	0	6	0	0	2
Alabama:												
Birmingham	0	0	1	0	0	0	7	0	3	0	0	0
Mobile	2	0		0	0	0	2	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0		0	0	0	3	0	2	0	0	0
Louisiana:												
New Orleans	11	0		0	3	1	[illegible]	1	10	0		0
Shreveport	2	0		0	0	0	8	0	0	0	0	0
Texas:												
Dallas	2	0		0	2	0	1	0	4	0	0	5
Galveston	0	0		0	0	0	0	0	0	0	0	0
Houston	4	0		0	0	1	5	1	6	0	4	0
San Antonio	1	0		1	0	0	5	0	5	0	1	0
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	0	0	1	0	1	0
Great Falls	0	0		0	0	0	0	0	4	0	0	2
Helena	0	0		0	0	0	0	0	1	0	0	3
Missoula	0	0		0	0	0	0	0	1	0	0	0
Idaho:												
Boise	3	0	0	0	0	0	0	1	0	0	0	0

See footnotes at end of table.

City reports for week ended October 28, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
MOUNTAIN—continued												
Colorado												
Denver	3	0	3	0	4	0	0	0	9	0	0	0
Pueblo	0	0		0	0	0	0	0	3	0	0	0
Utah												
Salt Lake City	0	0		0	1	0	1	0	3	0	0	10
PACIFIC												
Washington												
Seattle	1	0		1	6	0	6	2	5	0	1	0
Spokane	1	0	2	2	10	0	1	0	2	0	0	0
Tacoma	0	0		0	2	0	0	0	0	0	0	1
California												
Los Angeles	11	0	4	1	9	2	8	6	32	0	0	8
Sacramento	0	0		0	3	0	2	1	2	0	0	0
San Francisco	0	1		1	1	1	6	2	9	0	0	1
Total	105	4	43	23	205	60	335	198	587	0	24	459
Corresponding week 1943	81		7[illegible]	22	585		34[illegible]		77	0	12	662
Average 1939-43	8[illegible]		[illegible]9	[2] 20	[3] 307		[2] 315		567	0	26	948

[1] Information has been received that the 29 cases of encephalitis reported in Detroit in recent months include post infectional (12) lymphocytic choriomeningitis (9) type undetermined (4) and infectious type (4) (including the St Louis and equine types) A recent change in the State regulations groups all of the encephalitides and requires the reporting of all types

[2] 3 year average 1941-43

[3] 5 year median 1939-43

Dysentery amebic—Cases New York 1 Chicago 2 Topeka 1

Dysentery bacillary—Cases New York 24 Rochester 8 Syracuse, 7 Cleveland 3 Chicago, 1 Detroit, 5 St Louis, 2 Baltimore 1 Atlanta 1 Los Angeles 4

Dysentery unspecified Cases Richmond 1

Leprosy Cases New York 1

Typhus fever endemic Cases Charleston S C 1 Savannah 3 Tampa 2 Nashville 3 Birmingham 2 Mobile 6 New Orleans 4 Dallas 1 Houston 5 San Antonio 3

Rates (annual basis) per 100 000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 33,926,300)

		Encephalitis infectious case rate	Influenza Case rate	Influenza Death rates	Measles case rates	Meningitis meningococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rate	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	0 0	0 0	2 6	0 0	233	20 9	94 1	23 5	178	0 0	0 0	78
Middle Atlantic	6 9	0	3 2	2 8	12	8 8	47 7	50 9	57	0 0	4 6	68
East North Central	9 0	0 0	3 2	1 9	10	10 9	30 9	13 5	96	0 0	1 3	58
West North Central	31 8	2 0	9 9	2 0	16	11 9	75 6	39 8	76	0 0	0 0	117
South Atlantic	27 8	0 0	21 2	8 2	13	6 5	[illegible]0 7	37 6	141	0 0	0 0	150
East South Central	17 7	0 0	17 7	11 8	24	5 9	159 4	5 9	136	0 0	0 0	65
West South Central	60 3	0 0	0 0	2 9	14	7	80 3	[illegible] 7	77	0 0	28 7	14
Mountain	47 7	0 0	23 8	0 0	40	0 0	7 9	7 9	175	0 0	7 9	119
Pacific	20 6	1 6	9 5	7 9	71	4 7	36 4	17 4	79	0 0	1 6	16
Total	16 2	0 6	6 6	3 [illegible]	32	9 2	51 6	30 5	90	0 0	3 7	[illegible]

PLAGUE INFECTION IN SAN BERNARDINO COUNTY, CALIF., AND TACOMA, WASH.

Plague infection has been reported proved in a pool of 67 fleas from 7 ground squirrels, *C. fisheri*, taken Oct. 10 from Green Valley, 8 miles west of Big Bear Lake, San Bernardino County, Calif., and in a pool of 50 fleas from 23 rats, *R. norvegicus*, collected Oct. 23 at the waterfront, Tacoma, Wash.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 14, 1944.—During the week ended October 14, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		33		81	77	59		17	29	303
Diphtheria	1	4	3	59	6	3	8	1	1	86
Dysentery										
Bacillary				29					3	32
Unspecified					2					2
Encephalitis, infectious						1			1	2
German measles				5	1		3		5	14
Influenza					4	1			3	8
Measles		1	3	100	46	12	19	1	24	206
Meningitis, meningococcus		1		2	6	1		1		11
Mumps		2		92	32	1	1	20	23	171
Poliomyelitis			1	1	[1] 20	1	2	2	3	[1] 30
Scarlet fever		15	20	136	83	14	3	29	26	326
Tuberculosis (all forms)		6	1	165	52	7		31	21	283
Typhoid and paratyphoid fever			11	30	2			1	1	45
Undulant fever				5						5
Venereal diseases										
Gonorrhea	2	28	24	76	115	42	26	32	68	413
Syphilis	1	7	13	87	96	14	10	9	22	259
Whooping cough		20		158	35	9	2	31	21	276

[1] Includes 12 cases, delayed reports.

JAMAICA

Notifiable diseases—4 weeks ended October 21, 1944.—During the 4 weeks ended October 21, 1944, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	4	14	Puerperal fever		1
Diphtheria	1	2	Tuberculosis	36	42
Dysentery	33	17	Typhoid fever	13	76
Leprosy		3			

NEW ZEALAND

Notifiable diseases—4 weeks ended October 7, 1944.—During the 4 weeks ended October 7, 1944, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	31	3	Puerperal fever	8	
Diphtheria		3	Scarlet fever	674	1
Dysentery, bacillary	6		Tetanus	1	
Erysipelas	24		Trachoma	3	
Lead poisoning	1		Tuberculosis (all forms)	160	52
Malaria	64		Typhoid fever	15	
Ophthalmia neonatorum	1		Undulant fever	2	

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–August 1944	September 1944	October 1944—week ended 7	14	21	28
ASIA							
Ceylon	C	2					
India	C	1[illegible] 192	18 345				
Calcutta	C	3 087	166	39			
Chittagong	C	63					
Madras	C	36	1				
Negapatam	C	17					
Vizagapatam	C	269					

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January–August 1944	September 1944	October 1944—week ended 7	14	21	28
AFRICA							
Algeria	C	2	30		17		
Bechuanaland	C						1
Belgian Congo	C	4	8				
Plague-infected rats		1					
British East Africa:							
Kenya	C	6	5	1			
Uganda	C						
Egypt	C	639	2			2	
Port Said	C	71	2			1	
Suez	C	157				1	
French West Africa: Dakar	C	308	164	19	15		
Madagascar	C	80					
Morocco (French)	C	139	3				
Rhodesia, northern	C	1					
Senegal	C	29	12				
Tunisia	C	1	1			1	
Union of South Africa	C	23	13				
ASIA							
China:							
Chekiang Province	C		I				
Foochow	C	P					
Kiangsi Province	C	P	104				
India	C	2[illegible]2	455				
Indochina	C	7					
Palestine	C	20	24	8	6	6	
Plague-infected rats		53					

See footnotes at end of table.

PLAGUE—Continued

Place		January-August 1944	September 1944	October 1944—week ended— 7	14	21	28
EUROPE							
Portugal: Azores	C	14	6		3	-	
SOUTH AMERICA							
Bolivia:							
Chuquisaca Department	C	5					
Santa Cruz Department	C	5					
Tarija Department	C	12					
Brazil	C	94					
Ecuador:							
Chimborazo Province	C	4					
Loja Province	C	4					
Peru:							
Ancash Department	C	57					
Lambayeque Department	C	1					
Libertad Department	C	3	1				
Lima Department	C	17	3				
Piura Department	C	2					
OCEANIA							
Hawaii Territory:							
Hamakua District	D	[3] 5					
Plague-infected rats [4]		[5] 49	1				

[1] For the period Oct. 1-10, 1944.
[2] From the beginning of the outbreak in August 1944.
[3] Includes 1 death from pneumonic plague.
[4] 53 fleas were also proved positive for plague on Mar. 7, 1944.
[5] Includes 12 plague-infected mice. Plague-infected tissue in a pool of 8 mice was also reported during August 1944.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		January-August 1944	September 1944	October 1944—week ended— 7	14	21	28
AFRICA							
Algeria	C	791	14				
Angola	C	35					
Basutoland	C	201					
Belgian Congo	C	1,385	441				
British East Africa:							
Kenya	C	2,964	98	15			
Mombasa	C	143					
Tanganyika	C	2,624					
Uganda	C	3,339	411	116			
Cameroon (French)	C	365	2				
Dahomey	C	85	3				
Egypt	C	10,804	27				
French Equatorial Africa	C	1,27[illegible]					
French Guinea	C	880	111		[1] 16		
French West Africa	C	120	9				
Gambia	C	13					
Gold Coast	C	7					
Ivory Coast	C	414	14		[1] 7		
Mauritania	C	2					
Morocco (French)	C	648	32				
Mozambique	C	3					
Nigeria	C	3,519	199				
Niger Territory	C	554	28				
Senegal	C	184	6				
Sierra Leone	C	393					
Sudan (Anglo-Egyptian)	D	1					
Sudan (French)	C	1,894	32		[1] 34		
Tunisia	C	6					
Union of South Africa	C	353	105				
ASIA							
Arabia	C	9	4				
Ceylon	C	8					
China: Kunming (Yunnan Fu)	C	53					
India	C	224,140	6,179				
Indochina	C	1,557					
Iran	C	790					
Iraq	C	32	6	3	1		
Palestine	C	162	3				
Syria and Lebanon	C	179					

See footnotes at end of table.

SMALLPOX—Continued

Place		January-August 1944	September 1944	October 1944—week ended 7	14	21	28
EUROPE							
France	C	1					
Gibraltar	C	1					
Great Britain	C	[2] 18					
Greece	C	321					
Italy	C	638	123	48	32		
Portugal	C	31	1				
Spain	C	166					
Turkey	C	5 628					
NORTH AMERICA							
Dominican Republic	C	1					
Guatemala	C	8	1				
Honduras	C	9					
Mexico	C	2 298					
Panama (Republic)	C		1				
SOUTH AMERICA							
Bolivia	C	754					
Brazil	C	610	138	29	2		
Chile	C						15
Colombia	C	341	19	3	3	2	
Ecuador	C	19					
Peru	C	236					
Lima	C	19					
Venezuela	C	314	54				

[1] For the period Oct 1 10 1944
[2] Includes 4 imported cases
[3] Includes 1 case imported from the Middle East

TYPHUS FEVER

[C indicates cases]

Place		January-August 1944	September 1944	October 1944—week ended 7	14	21	28
AFRICA							
Algeria	C	1 190	53		18		
Basutoland	C	95					
Belgian Congo	C	16	16				
British East Africa Kenya	C	7	5	1			
Egypt	C	16 727	135				
French Guinea	C	2					
French West Africa Dakar	C	4	1				
Gold Coast	C	5					
Morocco (French)	C	330	52				
Morocco (Spanish)	C	8					
Mozambique	C	2					
Nigeria	C	[illegible]					
Rhodesia northern	C	75					
Sierra Leone	C	30					
Sudan (Anglo Egyptian)	C	2	1				
Tunisia	C	636	72				
Union of South Africa	C	458					
ASIA							
Arabia Western Aden Protectorate	C	15					
Ceylon	C	1					
China Kunming (Yunnan Fu)	C	77	25				
India	C	6	4				
Indochina	C	1 004					
Iran	C	6 425					
Iraq	C	578					
Palestine	C	442	23	12	1	1	
Syria and Lebanon	C	428					
Trans Jordan	C	45					
EUROPE							
Belgium	C	10					
Bulgaria	C	686					
France	C	11					
Germany	C	215					
Greece	C	294					
Hungary	C	3 225	74	10			
Irish Free State	C	[illegible]					
Italy	C	7	2				
Netherlands	C	8					
Norway	C	1					
Portugal	C	4	4	2	1	3	
Rumania	C	6 000					
Slovakia	C	335					
Spain	C	463		2			
Turkey	C	2,286	48				
Yugoslavia	C	7,434					

See footnotes at end of table

TYPHUS FEVER—Continued

Place		January-August 1944	September 1944	October 1944—week ended 7	14	21	28
NORTH AMERICA [1]							
Costa Rica	C	2					
Dominican Republic	C	10					
Guatemala	C	1 703	117				
Jamaica	C	54					
Mexico	C	1 286					
Panama Canal Zone	C	1					
Puerto Rico (endemic)	C	160	11				
Salvador	C	4	3				
Virgin Islands	C	19					
SOUTH AMERICA							
Bolivia	C	192					
Brazil	C	4					
Chile	C	349	1[illegible]				
Colombia	C	278	13				
Curacao	C	4	1		1		
Ecuador	C	2[illegible]3	23				
Peru	C	650					
Venezuela	C	[illegible]	10				
OCEANIA							
Australia	C	1[illegible]		1			
Hawaii Territory	C	9[illegible]		[illegible]	[illegible]		

[1] For the period Oct 1 10 1944
[2] A report dated Mar 30 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate Arabia
[3] Cases of typhus fever listed in this area are probably of endemic type

YELLOW FEVER

[C indicates cases D deaths]

Place		January-August 1944	September 1944	October 1944—week ended 7	14	21	28
AFRICA							
Belgian Congo							
Babeyru	D						
Banzyville	C	13					
Bondo	D	1					
Leopoldville	C	1					
French Guinea Kindia	C			1			
Gold Coast [2]							
Cape Coast	C	1					
Kintampo	C	1					
Northern Territories	C	1					
Sekondi	C	1					
Tamale	C	[3] 1					
Yendi	C	1					
Ivory Coast Abidjan	C	1					
Portuguese Guinea Fort Bintam	C	1					
EUROPE							
Portugal Lisbon [4]							
SOUTH AMERICA							
Bolivia							
La Paz Department	C	1					
Santa Cruz Department	C	3					
Brazil							
Acre Territory	D	1					
Matto Grosso State	D	3					
Para State	D	2					
Colombia							
Boyaca Department	D	2					
Caldas Department	D	1					
Cundinamarca Department	D	1					
Santander Department	D	4					
Venezuela Tachira State	C		8			1	

[1] Includes 11 suspected cases of yellow fever
[2] During the week ended Sept 30 1944 1 case of yellow fever was reported in Gold Coast no location being given
[3] Suspected
[4] According to information dated Jan 21, 1944 it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. St. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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FLUORIDE DOMESTIC WATERS AND SYSTEMIC EFFECTS [1]

I. Relation to Bone-Fracture Experience, Height, and Weight of High School Boys and Young Selectees of the Armed Forces of the United States

By F. J. McClure, *Senior Biochemist, United States Public Health Service*

The involvement of skeletal tissue as an effect of toxic quantities of fluorine has been noted in a number of clinical and epidemiological studies (*1*, *2*). The results of two experiments, one related to dairy cattle (*3*), the other to swine (*4*), have attributed reduced breaking strength of long bones to excessive fluorosis. On the contrary, an increase in breaking strength of long bones of dairy cattle (*5*) has been related to an enlargement of shaft walls which frequently accompanies extreme cases of fluorine toxicosis. Sometime ago it was suggested by Christiani (*6*) that fluorine might cause bones to become fragile, a suggestion which gains support from evidence that toxic skeletal effects of fluorine resemble osteosclerosis. There is the implication, therefore, that even in young individuals exposure to fluorine may be indirectly responsible for an unusual number of bone fractures. Involvement of skeletal tissues from excessive fluorine is shown in certain other results of clinical studies (*1, 2, 7, 8, 9, 10, 11*), as well as in results of certain animal experiments (*3, 4, 12, 13, 14, 15, 16*).

In order to obtain information regarding possible skeletal effects of dietary fluorine, an attempt has been made to discover a relation between fluorine ingestion via domestic drinking waters and the height, body weight, and bone-fracture experience of selected groups of 1,458 high school boys and 2,529 young adult men taking the physical examination at United States armed forces induction centers. The significance of these studies relates to two facts: (a) many drinking waters in the United States and other parts of the world contain fluorides (*17*); and (b) it has been suggested that optimum quantities of fluoride might be added to domestic water supplies (*18*, *19*) or directly to children's diets (*20*) for the partial control of dental caries.

[1] From the Dental Research Section, Division of Physiology, National Institute of Health.

Any information which suggests a health hazard surrounding either natural or artificial sources of fluorine in human diets is of obvious interest.

PLAN OF STUDY

Procedure for obtaining physical data.—Bone-fracture data, presented in table 3, were obtained by personal interviews with selectees who reported for physical examination at induction centers located in Lubbock, Tex.; Oklahoma City, Okla.; Indianapolis, Ind.; Fort Myer, Va. (Washington, D. C., area); and Manchester, N. H. Each man was questioned as to birthplace, continuity of residence, age (as of last birthday), and bone-fracture experience. In most instances attention was called to specific body members (arm, rib, nose, collarbone, etc.). In many cases the selectee was asked to describe the nature or seriousness of his injury, in order to determine, if possible, that a fracture had actually been sustained. In general, it is believed that major breaks were accurately reported, and the data as obtained are satisfactory for comparative purposes. Height and weight (without clothing) were measured by Service personnel as a regular routine in the physical examination. Height was measured by a measuring rod attached to the weight scale.

The data shown in table 4 were copied from Army records on file at the Lubbock, Tex., induction center. The physical examination of these 935 men is assumed to be reasonably uniform. Practically all the men whose records were copied passed through the Lubbock induction center within the last 6 months of 1942 and the first 6 months of 1943.

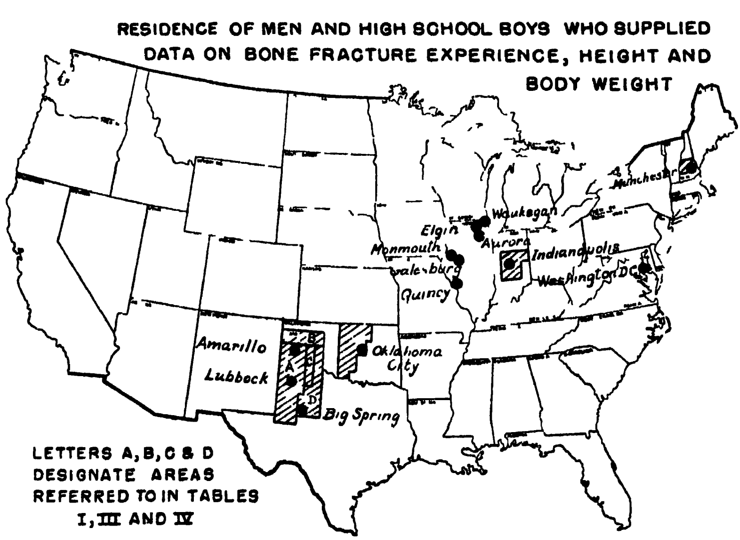

FIGURE 1.

The procedure followed for the high school boys listed in table 2 was similar to that followed at the induction centers. Boys aged 15 to 17 years (age as of last birthday) were interviewed at high schools located in Galesburg, Monmouth, Quincy, Aurora, Elgin, and Waukegan, Ill., and Washington, D. C. Only boys who gave their residences as practically continuous in their home towns were accepted for final data. Each boy was asked to state his history of bone fractures. Height was measured by a rod attached to the weight scale. Height and weight (without clothing) were taken by the writer or, under the writer's supervision, by a boy selected from each group. These groups consisted of 15 to 20 boys each. It should be noted that the weight scale with height rod was the one currently in use in the schools. The writer's height and weight were checked on the scale and height rod of each school. No appreciable variation was apparent from one school to another.

In addition to obtaining the above physical data at the induction centers and high schools, a large number of urine specimens were obtained for fluorine analysis. These analytical fluorine data are reported in a subsequent article, the second in this series.

Fluoride exposures in various areas studied.—The selection of areas of fluoride and nonfluoride exposure was made on the basis of (a) previous studies of endemic dental fluorosis, particularly by H. T. Dean and his associates (*17, 21*), and others (*22, 23*), (b) water fluoride chemistry (*23, 24, 25, 26, 27, 28*) (see also table 1), and (c) incidence of dental caries (*29, 30, 31, 32, 33*) (see also fig. 2).

Dean, Dixon, and Cohen (*21*) studied the incidence and severity

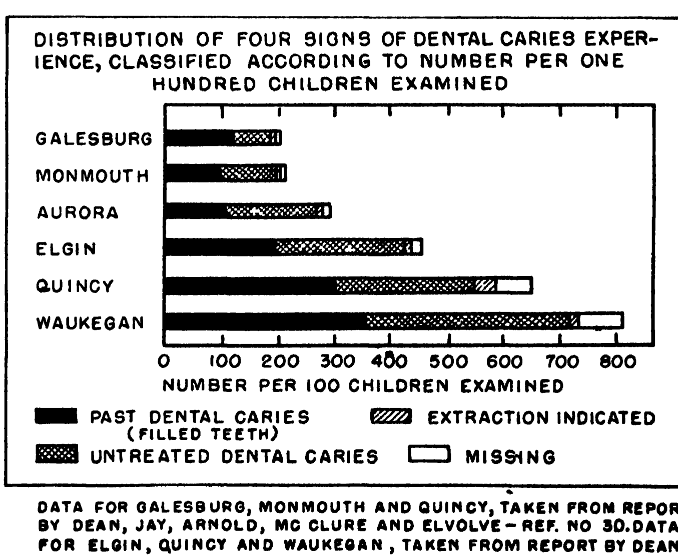

FIGURE 2.

of mottled enamel in the Panhandle-West Texas area in 1934. They concluded that this area "constitutes the largest mottled enamel area in the United States." A lifetime exposure to fluoride-bearing drinking water experienced by these children at approximately age 12 (*21*) is now unquestioned as the cause of their mottled enamel (*17*). Analysis of drinking waters from this locality shows the presence of unusual quantities of fluorine. (See table 1 for analytical data covering waters of this area.) The evidence of continuous fluoride exposure (mottled enamel) in children, with an average age of about 12 years, residing particularly in Texas area "A" in 1934, is good assurance that continuous residents aged 18 to 25 years in 1943 (the year of this survey) were similarly exposed to fluoride waters throughout life. Areas "A," "B," "C," and "D" (see tables 1, 3, and 4) were selected for varying levels of fluoride exposure within the West Texas-Panhandle area.

Men reporting to the Lubbock, Tex., induction center (and also to the other induction centers where this survey was made) usually arrived by county groups, and, with the exception of men from Lubbock and Amarillo, Tex., Indianapolis, Ind., and Washington, D. C., the county is the designated residence area. Many of the men in the Texas, Indiana, and New Hampshire groups came from ranches, farms, and small towns. The individual water histories of these men were not ascertained.

Residents of Texas areas "A" and "B" seem more or less certain to have been exposed to waters of high fluoride content. In general the waters of these areas come from a common aquifier, i. e., a porous sandy deposit known as the Ogallala formation (*25*). Area "C" (Gray, Donley, Hall, Motley, and Kent Counties) lies just east of the Ogallala formation. Fluorine in waters from this area averages somewhat less than 1.2 p. p. m. (table 1). Area "D" consists of Wheeler, Collingsworth, Childress, Cottle, and Stonewall Counties, east of area "C," and also includes a group of counties south and east of area "A." Water fluoride averages somewhat less than 1.0 p. p. m. F in this area (table 4). Mottled enamel is not present in endemic proportions in either area "C" or "D."

West central Oklahoma, the residence of 365 men interviewed at the Oklahoma City induction center (table 3), is designated as an area of borderline fluorosis. Mottled enamel, dental caries, and water relations of this Oklahoma area were summarized by Dean (*30*) in 1939 as follows:

An analysis of the dental caries rates of this State (Oklahoma) as reported in Public Health Bulletin No. 226, together with observations made by one of us (H. T. D.) in connection with mottled enamel studies, indicate that the dental caries rates are appreciably lower in that part of the State in general west of the Permian outcropping. The part of Oklahoma seemingly characterized by low

dental caries rates lies east of the Texas and Oklahoma Panhandles, a region where mottled enamel is generally endemic and dental caries rates low The slope topographically is eastward But the increased freedom from dental caries in this region may not be attributed entirely to fluoride in the water since preliminary tests have indicated concentrations of fluoride insufficient to produce considerable mottled enamel Sporadic instances, however, of very mild mottled enamel have been observed at Lawton, Chickasha, Shawnee, and other localities in this region This would indicate that small quantities of fluorides have been consumed by these populations

It may be noted that Dean's observations were made in 1939, at this time (1944) it is known that fluoride insufficient to produce mottled enamel may, however, be sufficient to appreciably reduce dental caries (*29*)

The fluorine content of several communal waters from this Oklahoma area is shown in table 1

TABLE 1 —*Fluorine present in water supplies of communities in or near which the men and boys of this study have lived the major part of their lives*

Location	Date	Fluorine (p p m)	Reference
Rural central Indiana			
Hendricks County			
Danville [2]	1943	1 8	[1] F J M
Brownsburg	1943	7	27
North Salem	1943	1 0	27
Pittsboro	1943	6	27
Jay County			
Portland [2]	1943	7	[1] F J M
Do	1943	1 0	27
Dunkirk	1943	9	27
Pennville	1943	1 1	27
Madison County			
Anderson [2]	1943	3	[1] F J M
Alexandria	1943	4	27
Chesterfield	1943	0	27
Elwood	1943	1 0	27
Frankton	1943	0	27
Pendleton	1943	0	27
Summitville	1943	1 0	27
Boone County			
Lebanon [2]	1943	7	[1] F J M
Do	1943	1 0	27
Thorntown	1943	6	27
Zionsville	1943	6	27
Rush County			
Rushville [2]	1943	3	[1] F J M
Carthage	1943	0	27
Fountain County			
Attica	1943	4	27
Covington	1943	3	27
Hillsboro	1943	0	27
Veedersburg	1943	0	27
Morgan County			
Martinsville	1943	0	27
Mooresville	1943	3	27
Morgantown	1943	0	27
Carroll County			
Delphi	1943	6	27
Flora	1943	4	27
Franklin County			
Brookville [2]	1943	1	[1] F J M
Do	1943	0	27
Johnson County			
Edinburg	1943	0	27
Franklin	1943	9	27
Do [2]	1943	4	[1] F J M
Marion County			
Indianapolis	1943	2	[1] F J M
Rural New Hampshire			
Keene [2]	1943	0 0	[1] F J M
Nashua [2]	1943	0	[1] F J M
Manchester	1943	0	[1] F J M
Laconia [2]	1943	0	[1] F J M
Newport [2]	1943	0	[1] F J M
Lebanon [2]	1943	0	[1] F J M
District of Columbia			
Washington	1943	0 0	[1] F M J
West central Oklahoma			
Cotton County			
Walters [2]	1943	0 3	[1] F J M
Do	1932	2	23
Welch	1932	1 5	23
Garfield County			
Enid	1942	4	23
Covington	1932	0 2 3	23
Grady County			
Minco	1934	5	23
Rush Springs	1938	4	23
Tuttle	1932	3	23
Grant County			
Wakita	1932	3	23
Kay County			
Newkirk	1934	0- 1	23
Love County			
Marietta	1934	0	23
Major County			
Fairview	1934	1 0	23
Oklahoma County			
Oklahoma City	1934	5	[1] F J M
Do	1940	5-1 1	23
Osage County			
Fairfax	1932	2	23
Foraker	1934	1 0	23
Hominy	1932	2	23
Stephens County			
Duncan [2]	1943	3	[1] F J M
Do	1932	1 0-2 2	23
Woods County			
Alva	1934	0- 5	23
Woodward County			
Woodward	1934	0	23

See footnotes at end of table

TABLE 1.—*Fluorine present in water supplies of communities in or near which the men and boys of this study have lived the major part of their lives*—Continued

Location	Date	Fluorine (p. p. m.)	Reference
Illinois			
Galesburg	1933–34	1.8	28
Do	1938	1.9	30
Do [3]	1943	1.9	[4]C. A. K.
Do [5]	1943	1.8	[4]C. A. K.
Do [3]	1943	1.8	[4]C. A. K.
Monmouth	1933–34	1.7	28
Do	1938	1.6	30
Do [3]	1943	1.7	[4]C. A. K.
Aurora	1939–40	1.2	29
Do [2]	1943	1.0	[4]C. A. K.
Do [2]	1943	.9	[1]F. J. M.
Elgin	1939–40	.5	29
Do [2]	1943	.7	[1]F. J. M.
Quincy [2]	1938	.2	30
Do [3]	1943	.1	[4]C. A. K.
Waukegan	1938	0	29
Do [3]	1943	.1	[4]C. A. K.
Texas area "A"			
Lubbock	1933–34	4.4	28
Do	1934	4.2	28
Do [3]	1943	3.8	[1]F. J. M.
Lubbock Army Air Field	1943	5.1	[1]F. J. M.
Lubbock Glider Field	1943	2.0	[1]F. J. M.
Amarillo	1933–34	3.9	28
Do	1934	5.[illegible]	28
Do	1943	5.1	[6]J. W.
Do	1943	4.3	[6]J. W.
Hereford	1941	3.[illegible]	[7]E. E.
Spur	1943	3.8	[7]E. E.
Slaton	1935	5.2	[7]E. E.
Post	1935	6.0	[7]E. E.
Levelland [2]	1943	3.4	[1]F. J. M.
Levelland	1943	3.5	26
Muleshoe	1938	1.5	26
Crosbyton	1939	2.8	26
Ralls	1938	2.4	26
Lamesa	1938	5.2	26
Do [2]	1943	3.9	[1]F. J. M.
Floydada	1943	2.5	26

Location	Date	Fluorine (p. p. m.)	Reference
Texas area "A"—Continued			
Lockney	1937	2.5	26
Seminole [2]	1943	2.3	[1]F. J. M.
Plainview	1933–34	2.9	[7]E. E.
Hale Center	1939	3.4	26
Tahoka	1938	4.0	26
Midland	1938–39	2.5–3.6	26
Texas area "B"			
Canadian	1936–38	0.8–1.2	26
Dalhart	1939	1.2	26
Do [2]	1943	.6	[1]F. J. M.
Texline	1936–39	1.0	26
Dumas	1939	1.8	26
Spearman	1937	1.8–2.3	26
Booker	1938	.6	26
Texas area "C"			
Memphis		1.0–1.3	26
Lefors	1939	.6–.8	26
McLean	1938	.8	26
Pampa	1938	.8	26
Do [2]	1943	.8	[1]F. J. M.
Memphis	1936	.3	26
Estelline	1936	.6	26
Clarendon [2]	1943	.2	[1]F. J. M.
Matador	1939	1.0	26
Texas area "D"			
Big Spring	1933–34	0.7	28
Do	1934	1.1	28
Do [2]	1943	.8	[1]F. J. M.
Wheeler	1938	.4	26
Do [4]	1943	.3	[1]F. J. M.
Wellington	1936	.2	26
Do [2]	1943	.4	[1]F. J. M.
Paducah	1938	.4	26

[1] F. J. McClure.
[2] Water sample supplied by superintendent, City Water Co.
[3] Water from high school tap.
[4] C. A. Kinser, associate chemist, National Institute of Health.
[5] Sample supplied by L. A. Neifert, Knox College.
[6] Jack Wyatt, city chemist, Amarillo, Tex., private communication.
[7] Elias Elvove, senior chemist, National Institute of Health, private communication.

Indianapolis, Ind., and the counties included in the area designated as "rural central Indiana" (table 3) are not regarded as mottled enamel areas. The Indianapolis water supply contains currently 0.2 p. p. m. fluoride (F). Fluorine in other waters from this area is reported in table 1. The current water supply of Danville (Hendricks County), Ind., shows 1.8 p. p. m. fluorine, an unusually high figure for this area. There were, however, only 18 men from Hendricks County among the group of 232 men from rural Indiana. The fluoride exposure of these 232 Indiana men according to available evidence would appear to average about 0.5 p. p. m. water-borne fluorine.

The District of Columbia obtains its water supplies from the Potomac River. The water contains currently 0.0 p. p. m. fluorine. Endemic dental fluorosis is not present among continuous residents of the District or its suburbs.

Waters from New Hampshire (table 1) are uniformly free of fluoride. Mottled enamel is not present. New Hampshire, in common with most of the New England States, has a particularly high rate of dental caries (*33*).

Dean and his associates studied the dental health of 12- to 14-year-old children residing continuously in Galesburg, Monmouth, and Quincy, Ill., in relation to fluoride in local drinking water (*30*). This survey, which was made in 1938, should be consulted for a complete history of the communal water supplies of these three cities. Children aged 12 to 14 years residing continuously in Aurora, Elgin, and Waukegan, Ill., were subjects of a dental study by Dean and his associates in 1940 (*29*). This later report should also be consulted for a history of water supplies of these towns. Table 1 shows fluorine analysis of drinking waters used in these six Illinois towns.

Figure 2, copied from the reports by Dean, Jay, Arnold, McClure, and Elvove (*30*), and Dean, Jay, Arnold, and Elvove (*29*), shows the relative dental caries experience among 12- to 14-year-old children residing in these six Illinois towns.

DISCUSSION

Athletic injuries, including incidence and types of fractures associated with various sports have been tabulated (*34*). There are also numerous statistics on fractures due to occupational, domestic, and traffic accidents (*35*); Grauhan and Schulz (*36*) classified 872 hospital-treated fracture cases according to age. They found the greatest frequency for ages 10 to 15 years. There was a surprising drop in incidence between ages 15 and 20, a sharp rise in the group aged 25 to 30, followed by a marked and continuous decline for older age groups. These workers observed that a majority of fractures were not due to major accidents or catastrophes, but to minor everyday happenings such as slipping on floors, falls from bicycles, etc., and playing games. These causes surrounded particularly the young age groups. Industrial hazards naturally played an important role among older groups. Many more fractures occurred in boys than in girls. In the 10- to 15-year age group, for example, there were 4 fractures in boys to 1 in girls (*36*).

In analyzing the data presented in tables 2, 3, and 4, and in figures 3 and 4, it is assumed that the usual activities (play, sports, etc.) which may influence the bone-fracture experience, will be similar for the various localities studied. The individual's economic status and

industrial pursuits also may be presumed to affect the bone-fracture hazard. These variables, it will be noted, were not measured. In the case of New Hampshire men vs. the Oklahoma men and the Texas men, there seems some justification for regarding the outdoor activities as variable. Likewise, the communal life of the Wash-

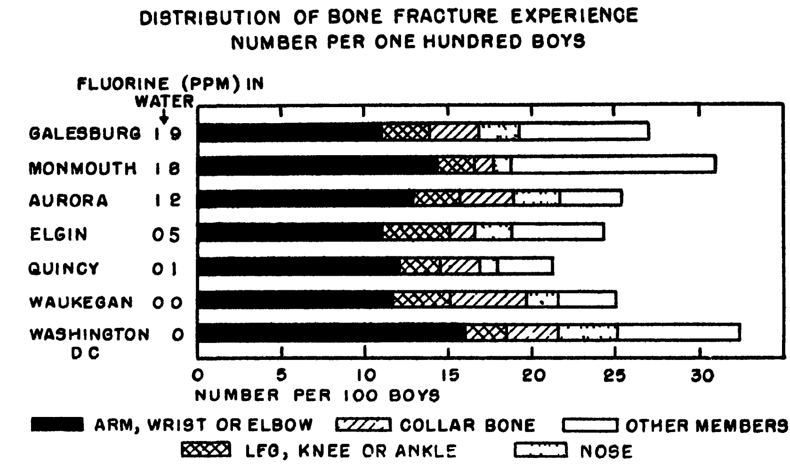

FIGURE 3

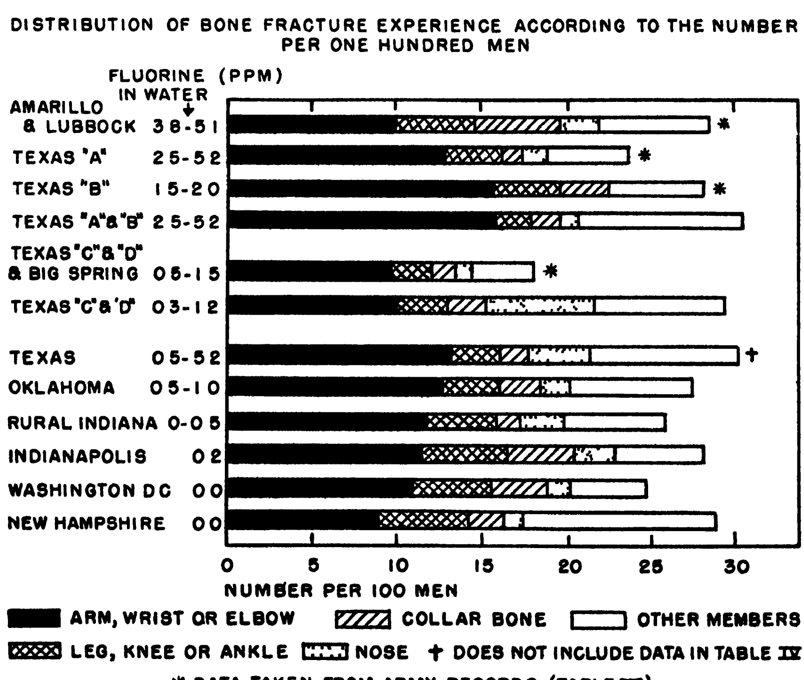

FIGURE 4.

ington, D. C., boys seems to be different from that of Illinois boys. The boys living in Washington, D. C., seem to fall into a somewhat different category than the Illinois boys, because of their residence in a large metropolitan center. In general, these boys are from families above average economic status. They were located at the Woodrow Wilson High School in one of the better residential areas of Washington. With the exception of Aurora, Ill., the Illinois cities studied had but one high school, which made it possible to interview representative groups of boys. In Aurora the boys were enrolled at East Aurora High School, the larger of two city high schools. A good cross section of the community is represented among the pupils of this school. Population statistics for these Illinois cities have been discussed in reports of previous dental studies (*29*, *30*).

Inspection of bone-fracture experience among the different groups of high school boys (table 2 and fig. 3) does not reveal differences of great significance. No relation can be found between fluoride exposure and incidence of fractures in these age groups. In general the data would appear to be remarkably consistent. As noted above, the

TABLE 2.—*Bone-fracture experience, height, and weight of 1,458 high school boys aged 15 to 17 years, residing in 6 Illinois towns and Washington, D. C., where community water supplies varied in fluorine content from 0.0 to 1.9 p. p. m.*

Location	Galesburg	Monmouth	Galesburg and Monmouth	Aurora	Elgin	Quincy	Waukegan	Quincy and Waukegan	Washington D. C.[1]
Fluorine in water (p. p. m.)	1.9	1.7	1.7-1.9	1.2	0.5	0.1	0.0	0.0-0.1	0.0
Number of boys	207	90	297	248	218	206	203	409	286
Boys aged 15 years (percent)	37.05	41.11	38.33	45.56	30.27	22.33	46.79	34.47	30.77
Boys aged 16 years (percent)	36.04	35.55	35.89	33.46	34.86	39.32	38.92	39.12	39.51
Boys aged 17 years (percent)	26.91	23.34	25.78	20.98	34.86	38.35	14.29	26.41	29.72
Continuity of residence (years)	15.8	15.1	15.5	15.6	15.7	15.5	15.2	15.4	15.1
Average age (years)	16.1	15.8	16.0	15.9	16.1	16.2	15.7	15.9	16.0
Average height (inches)	67.6	66.5	67.2	66.7	68.0	67.2	67.4	67.3	68.4
Average weight (pounds)	138.2	129.9	135.6	136.5	136.1	134.2	135.8	135.0	140.7
BONE-FRACTURE EXPERIENCE (NUMBER PER 100 BOYS)									
Arm, wrist, or elbow	11.1	14.4	12.1	12.9	11.0	12.1	11.8	12.0	16.1
Leg, knee, or ankle	2.9	2.2	2.7	2.8	4.1	2.4	3.4	2.9	2.4
All fractures of arm and leg	14.0	16.6	14.8	15.7	15.1	14.5	15.2	14.9	18.5
Collar bone	2.9	1.1	2.4	3.2	1.4	2.4	4.4	3.4	3.1
Nose	2.4	1.1	2.0	2.8	2.3	1.0	2.0	1.5	3.5
Other members fractured	7.7	12.2	9.1	3.6	5.5	3.4	3.4	3.4	7.3
Total of all fractures	27.0	31.0	28.3	25.3	24.3	21.3	25.0	23.2	32.4
PERCENT OF BOYS HAVING BONE FRACTURE EXPERIENCE									
Boys experiencing 1 or more fractures	23.7	22.2	23.2	19.8	21.6	18.0	19.7	18.8	23.1
Boys experiencing more than 1 fracture	2.9	4.4	3.4	5.2	2.3	3.4	4.4	3.9	4.5

[1] There were 67 boys in this group whose continuous residence was in Washington, D. C., and in one of the following cities: New York, Chicago, Baltimore, Brooklyn, Boston, Detroit, Philadelphia, and Atlantic City. There is reasonable assurance that the water supplies of these cities are practically fluoride-free.

data supplied by boys from Washington, D. C., may have been influenced by their economic status and facilities for athletic activities. Arm and leg fractures show a particularly uniform incidence, equalling 11 to 12 cases per 100 boys. From 50 to 60 percent of all the fractures are accounted for by arm and leg fractures. These fractures therefore occurred most frequently, and their incidence in particular indicates the ability of the important long bones to resist an outside force or unusual strain.

Other fractures, i. e., collar bone, nose, and miscellaneous fractures (ribs, fingers, toes, hands, and feet), show considerable variation, possibly because these usually constitute minor injuries and leave more varying memories. Fractures to skull, spine, and neck are included in the group of "other members fractured" (tables 2, 3, and 4). There were very few such fractures reported.

The fracture experience of different groups of Army inductees (table 2) did not bring out differences significant in themselves or related to fluoride exposure. There appears to be a slight but consistent

TABLE 3.—*Bone-fracture experience, height, and weight of 1,594 men reporting for physical examination at armed forces induction centers located in selected fluoride and nonfluoride areas of the United States*

Area classification	Fluoride			Borderline fluoride	Nonfluoride			
Fluorine in drinking water (p. p. m.)	2.0–5.0	0.3–1.0	0.3–5.0	0.5–1.0	0.0–0.5	0.2	0.0	0.0
Location	Texas area "A" and "B"	Texas area "C" and "D"	All Texas areas	West-central Oklahoma	Rural-central Indiana	Indianapolis Indiana	Washington, D. C.	Central New Hampshire
Number of men interviewed	190	138	[1] 328	365	232	210	213	246
Continuity of residence (years)	17.0	15.8	16.5	18.1	19.6	19.3	21.3	22.0
Average number of years in school	10.7	11.5	11.0	10.6	11.2	11.7	11.1	10.7
Average age (years)	19.9	18.7	19.0	18.8	20.1	19.4	21.8	22.5
Average height (inches)	69.6	69.5	69.6	69.4	68.1	68.3	69.3	67.3
Average weight (pounds)	149.7	147.9	149.0	142.4	146.8	146.2	151.2	149.6
BONE-FRACTURE EXPERIENCE (NUMBER PER 100 MEN)								
Arm, wrist, or elbow	15.8	9.8	13.3	12.6	11.6	11.4	10.8	8.9
Leg, knee, or ankle	2.1	3.6	2.7	3.3	4.3	5.2	4.7	5.3
All fractures of arm and leg	17.9	12.9	16.0	15.9	15.9	16.6	15.5	14.2
Collar bone	1.6	2.2	1.8	2.5	1.3	3.8	3.3	2.0
Nose	1.1	6.5	3.4	1.9	2.6	2.4	1.4	1.2
Other members fractured	9.9	7.9	9.1	7.2	6.0	5.2	4.7	11.4
Total of all fractures	30.5	29.5	30.3	27.5	25.8	28.0	24.9	28.9
PERCENT OF MEN HAVING BONE-FRACTURE EXPERIENCE								
Men experiencing 1 or more fractures	26.3	24.5	25.5	23.3	24.1	22.5	22.1	25.6
Men experiencing more than 1 fracture	3.2	4.3	3.6	3.8	1.7	4.8	2.8	3.3

[1] 187 of these men from Texas areas were students at the Texas Technological College, Lubbock, Tex.

decrease in arm, wrist, and elbow fractures, beginning with Texas men (0.5–5.2 p. p. m. F) and proceeding through fracture incidence in Oklahoma men (0.5–1.0 p. p. m. F), rural Indiana (0.0–0.5 p. p m. F), and Indianapolis, Ind., men (0 2 p. p. m. F), to Washington, D. C., and New Hampshire men (0.0 p. p. m. F) (table 3 and fig 4). It appears wise at this time to regard the differences between New Hampshire and Washington, D. C., men and Oklahoma and Texas men, for example, as either fortuitous or possibly due to more hazardous activities connected with rural outdoor life in Texas and Oklahoma areas. Urban populations (Amarillo and Lubbock), however, showed no more fractures than Washington, D. C. Men from rural Indiana and Indianapolis possibly represent more nearly average or normal exposure to fracture-inducing activities.

The data copied from Army physical examination records on file at the Lubbock, Tex., induction center are, in general, similar to bone

TABLE 4.—*Bone-fracture experience, height, and weight of 935 men reporting for physical examination at armed forces induction center, Lubbock, Tex. Data copied from Army records*

Mottled enamel index [1]	Very marked to medium			Slight	Borderline to negative				
Fluorine in drinking water, estimated (p p m)	2 0–5.1			1 2–2 0	0 3–1 0				
Location [2]	Amarillo and Lubbock	Area "A"	Area "A" Amarillo and Lubbock	Area "B"	Area "C"	Area "D"	Big Spring	Areas "C" and "D" and Big Spring	All Texas areas
Number of men	178	337	515	71	98	208	43	349	935
Average years in school [3]	10 7	10 4	10 5	10 8	10 1	10 0	9 7	10 1	10 3
Average age (years)	20 4	20 7	20 6	21 5	21 3	21 2	21 4	21 3	20 9
Average height (inches)	69 1	69 3	69 2	69 0	69 3	69 4	68 9	69 3	69 2
Average weight (pounds)	149 0	146 2	147 1	149 6	148 4	149 8	147 4	149 1	148 1
BONE-FRACTURE EXPERIENCE (NUMBER PER 100 MEN)									
Arm, wrist, or elbow	10 1	12 8	11 8	15 5	11 2	8 7	11 6	9 7	11 3
Leg, knee, or ankle	4 5	3 3	3 7	4 2	3 1	2 4	0 0	2 3	3 2
All fractures of arm and leg	14 6	16 1	15 5	19 7	14 3	11 1	11 6	12 0	14 5
Collar bone	5 1	1 2	2 5	2 8	2 0	1 4	0 0	1 4	2 1
Nose	2 2	1 5	1 6	0 0	2 0	0 0	2 2	0 9	1 3
Other members fractured	6 7	4 8	5 5	5 6	3 1	3 8	4 3	3 7	4 8
Total of all fractures	28 6	23 6	23 3	28 1	21 4	16 3	17 1	18 0	22 7
PERCENT OF MEN HAVING BONE-FRACTURE EXPERIENCE									
Men experiencing 1 or more fractures	21 3	19 9	20 4	23 9	20 4	13 9	17 1	16 3	19 1
Men experiencing more than 1 fracture	4 5	2 7	3 3	2 6	1 0	2 9	0 0	2 0	2 8

[1] See Mottled enamel in Texas, by H Trendley Dean, R. M Dixon, and Chester Cohen Pub. Health Rep., 50: 424–442 (March 1935)
[2] Only men were selected whose place of birth and current residence were the same
[3] Records were copied for men who had completed a minimum of 6 years of school.

fracture data obtained by the writer (table 3). It was particularly fortunate that the medical personnel at the Lubbock induction center were especially careful to determine the bone-fracture experience of men examined at that center. Inspection of the bone-fracture data (tables 3 and 4 and fig. 3) does not reveal differences among these various groups of men which may be related to fluorine exposure via drinking water.

Height and weight relations.—With the exception of Elgin boys, the average height of Illinois high school boys is 67.0 inches, varying from 66.7 inches for Aurora boys to 67.4 inches for Waukegan boys. Washington, D. C., and Elgin, Ill., boys average 68.4 and 68.0 inches respectively. Washington, D. C., boys average about 5 pounds heavier than the average weight of Illinois boys. In general these height and weight figures show no variations which are significant nor do any variations coincide with fluorine exposures. These figures compared with other height-weight data and standard for boys in these age groups are shown in table 5.

TABLE 5.—*Comparison of average height and weight of high school boys (table 2) with other height and weight data for boys aged 16 years*

	Height (inches)	Weight (pounds)	Reference
BOYS AGED 16 YEARS			
Baldwin-Wood tables	62-72	107-155	38
College students	67.48	133.70	37
Engelbach	61.8-66.2	96-122	39
Boys in military training camps	66.92	128.09	40
Medico-actuarial tables	(67)	(132)	41
Do	(68)	(136)	41
Do	(69)	(140)	41
BOYS APPROXIMATE AVERAGE AGE 16 YEARS			
Galesburg and Monmouth boys	67.2	135.6	Table 2
Aurora boys	66.7	136.5	Table 2
Elgin boys	68.0	136.1	Table 2
Quincy boys	67.2	134.2	Table 2
Waukegan boys	67.4	135.8	Table 2
Washington, D. C., boys	68.4	140.7	Table 2

The height of Texas men averages uniformly higher than men from other areas. Men from New Hampshire average slightly more than 2 inches shorter than men from Texas and Oklahoma (tables 3 and 4). The average-weight figures for all the men are quite uniform, equalling roughly 146 to 151 pounds, excluding Oklahoma men, who average 142.4 pounds.

In general the height-weight data presented in tables 3 and 4 give no indication of a relation to fluoride exposure. A comparison of these data with other similar data and height-weight standards, is presented in table 6.

TABLE 6.—*Comparison of height and weight of young adult male populations*

Age	19		20		21		22		Reference
	Height, inches	Weight, pounds	Height, inches	Weight, pounds	Height, inches	Weight, pounds	Height, inches	Weight, pounds	
College students	68 82	142.5	68.79	144 1	68.77	144.9			(37)
Army recruits 1906–15	66.97	136 3	67.02	138.1	67.33	141.2	67.34		37, 42
Engelbach	67.5	131.3	68.0	135.0					39
Men in citizen's training camps	68.07	137.7	68.10	139.9	68.16	140.9			40
Medico-actuarial tables	(67)	(138)	(67)	(140)	(67)	(142)	(67)	(143)	41
Do	(68)	(142)	(68)	(144)	(68)	(145)	(68)	(146)	41
Do	(69)	(146)	(69)	(148)	(69)	(149)	(69)	(150)	41
Texas areas "A" and "B"			69 6	149.7					Table 3
Texas areas "C" and "D"	69.5	147.9							Table 3
Texas area "A", Amrillo, Lubbock					69.2	147.1			Table 4
Texas areas "C" and "D" Big Spring					69.3	149.1			Table 4
All Texas areas	69.6	149.0							Table 3
Do					69.2	148.1			Table 4
West-central Oklahoma	69.4	142 4							Table 3
Rural-central Indiana			68.1	146.8					Table 3
Indianapolis, Ind	68.3	146 2							Table 3
Washington, D. C							69 3	151 2	Table 3
Central New Hampshire							67.3	149.6	Table 3
556 freshmen—Texas A. & M College [1]	69.2	145.3							(F. J. Mc.)
770 freshmen—Maryland University [1]	68.8	146.2							(F. J. Mc.)

[1] Boys aged 17, 18, and 19 years. Data copied from records of physical examination given at time of entry (1940–43).

SUMMARY

A study was made of the relation of fluoride (F) in drinking water to bone-fracture experience, height, and weight of high school boys and young adult males. Among high school boys the number of fractures per 100 boys varied from 21.3 to 32.4 The numbers of fractures to arms and legs per 100 boys varied from 14.0 to 18.5. These later fractures account for about 60 percent of all fractures. There was no relation of fracture experience to fluoride exposure. The average height and body weight of all the boys compared favorably with other height-weight data and accepted standards. The height-weight data were not related to fluoride exposures.

The bone-fracture experience of young adult males who were taking the physical examination at armed forces induction centers varied from about 25.0 to 30.0 fractures per 100 men averaging about 18 to 25 years of age. An experience of more than 1 fracture varied from 1.7 to 4.8 men per 100 men. While these data on bone-fracture experience for both men and boys of these ages do not permit final conclusions, they do suggest strongly that no serious impairment in skeletal performance, as might be manifest in number of broken bones, seems related to exposure to fluoride domestic waters of the concentrations studied in this survey.

Texas men exposed to highest water-fluorine concentrations and Oklahoma men averaged 69.6 and 69.4 inches in height (weight 149.0 and 142.4 pounds), respectively. Men from rural Indiana and Indianapolis averaged 68.1 and 68.3 inches in height, 146.8 and 146.2 pounds in weight, respectively. Washington, D. C., men averaged 69.3 inches and weighed 151.2 pounds on the average. New Hampshire men were 67.3 inches tall and weighed 149.6 pounds on the average. These height-weight figures showed no relation to fluoride exposure.

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PERMISSION FOR PUBLICATION

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

October 8-November 4, 1944

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended November 4, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis dropped from 4,451 during the preceding 4-week period to 2,464 for the 4 weeks ended November 4. By weeks the cases dropped from 1,683 in the peak week of the present epidemic (week ended August 2) to 521 cases during the week ended November 4. All sections of the country showed a decline in the number of cases in recent weeks. Although the epidemic appears to be about over there is still a relatively large number of cases. Compared with preceding years the number of cases was 1.6 times the incidence for the corresponding period in 1943 and 1.9 times the 1939–43 median. In the West South Central and Mountain regions the incidence was below the seasonal expectancy, but in other sections the excesses over the median ranged from 1.1 times the median in the Pacific region to more than 7 times the median in the Middle Atlantic section. In the 44 weeks since the beginning of 1944 there have been 17,888 cases of poliomyelitis reported as compared with 11,379 and 8,356 in the corresponding periods of 1943 and 1941, respectively. In 1942 there were 3,624 cases reported for these same weeks.

Meningococcus meningitis.—The number of cases (622) of this disease reported for the current 4-week period was only about 70 percent of the number reported for the corresponding period in 1943, but the incidence was still above the seasonal expectancy in all sections of the country. While the 1939–43 median falls within one of the low

years preceding the current high incidence of this disease, the average number of cases reported for this period in the years 1929-41 was approximately 220 cases, or less than one-third of the current incidence.

Influenza.—For the 4 weeks ended November 4 there were 5,629 cases of influenza reported, as compared with 5,583 in 1943 and a 5-year median of 5,009 cases. The incidence was higher than the normal seasonal expectancy in the New England, South Atlantic, and West South Central sections, but relatively low in all other sections. Approximately 4,500 of the total cases occurred in 3 States, viz, Texas (3,021), South Carolina (1,023), and Virginia (460).

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended November 4, there were 1,940 cases of diphtheria reported, as compared with 1,665, 2,484, and 2,480 for the corresponding period in 1943, 1942, and 1941, respectively. The incidence was about 15 percent above the 1943 figure, but it was less than 80 percent of the 1939–43 median, which is represented by the 1942 figure. Increases over 1943 were reported from all sections except the East North Central and South Atlantic. In 5 sections the incidence was above the 1939–43 median, in 3 sections the number of cases occurring during the current period fell below the 5-year median, and in 1 section, the New England, the incidence was about normal.

Measles.—For the current 4-week period the number of cases (2,188) of measles reported was less than [illegible] percent of the 1943 incidence and about 40 percent of the 1939–43 median. For the country as a whole the number of cases was the lowest reported for this period since 1936, when approximately 2,000 cases were reported. The incidence was below the preceding 5-year median in all sections except the West South Central and Pacific sections.

Scarlet fever.—The expected seasonal increase of scarlet fever appeared in all sections of the country during the current 4-week period. Compared with preceding years, however, the number of cases (8,492) was about 85 percent of the 1943 incidence during the corresponding period, and less than 95 percent of the 1939–43 median figure. Increases over the seasonal expectancy were reported from the New England, West South Central, Mountain, and Pacific sections, but all other sections reported a relatively low incidence.

Smallpox.—The number of cases (19) of smallpox reported during the 4 weeks ended November 4 was approximately the same as occurred during the corresponding period in 1943, but it was less than 50 percent of the 1939–43 median. States in the Mountain region reported 11 cases, as compared with a 5-year median of 2 cases; the remaining cases occurred in the East North Central section (7 cases) and East South Central section (1 case).

Number of reported cases of 9 communicable diseases in the United States during the 4 week period October 8 November 4, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43

Division	Current period	1943	5 year median	Current period	1943	5 year median	Current period	1943	5 year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1 940	[illegible]	2 480	[illegible]	[illegible]	5 009	2 188	9 773	5 283
New England	27	25	25	70	17	7	349	982	851
Middle Atlantic	97	83	136	31	46	46	255	1 389	926
East North Central	[illegible]	[illegible]	238	97	105	188	224	[illegible]	702
West North Central	154	133	128	23	33	46	86	[illegible]	352
South Atlantic	418	[illegible]	946	[illegible]	1 612	[illegible]	114	[illegible]	412
East South Central	334	271	375	118	240	210	28	[illegible]	158
West South Central	482	234	375	[illegible]	2 977	[illegible]	170	186	128
Mountain	85	[illegible]	57	[illegible]	306	[illegible]	101	413	516
Pacific	178	100	106	94	157	157	861	351	632
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	[illegible]	879	135	2 464	[illegible]	1 320	8 492	9 981	8 970
New England	44	91	12	136	123	34	[illegible]	[illegible]	611
Middle Atlantic	108	281	27	[illegible]	[illegible]	155	1 281	1 562	1 382
East North Central	[illegible]	170	[illegible]	[illegible]	[illegible]	223	[illegible]	[illegible]	2 355
West North Central	57	42	11	218	105	16	[illegible]	[illegible]	1 039
South Atlantic	[illegible]	[illegible]	26	341	26	69	[illegible]	[illegible]	1 390
East South Central	33	[illegible]	[illegible]	71	20	58	[illegible]	[illegible]	729
West South Central	[illegible]	37	8	38	120	50	[illegible]	[illegible]	320
Mountain	[illegible]	18	3	17	133	65	407	[illegible]	257
Pacific	[illegible]	73	10	117	[illegible]	103	[illegible]	94	528
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	[illegible]	[illegible]	[illegible]	407	414	847	[illegible]	[illegible]	[illegible]
New England	0	0	0	[illegible]	[illegible]	2	[illegible]	[illegible]	[illegible]
Middle Atlantic	0	0	0	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
East North Central	[illegible]		1	3	[illegible]	[illegible]	[illegible]	[illegible]	2 782
West North Central	0	[illegible]	11	18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
South Atlantic	0	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 194
East South Central	1		4	42	[illegible]	120	[illegible]	[illegible]	[illegible]
West South Central	0	1	[illegible]	[illegible]	71	119	[illegible]	[illegible]	387
Mountain	11	1	[illegible]	27	30	47	[illegible]	[illegible]	399
Pacific	0	0	1	31	27	30	[illegible]	801	802

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

Typhoid fever and paratyphoid fever.—The number of cases of typhoid fever declined considerably during the current 4-week period. Compared with preceding years the incidence (407 cases) was approximately the same as in 1943 and about 50 percent less than the 1939–43 median incidence for the same weeks. The situation was favorable in all sections of the country, the number of cases being below the median in all regions except the Pacific; in that area the number of cases was approximately the same as the median.

Whooping cough.—The number of cases of this disease was also relatively low, 5,939 cases being reported for the current 4 weeks, as compared with 9,242 for the same weeks in 1943 and a 5-year median of approximately 11,000 cases. The number of cases was about 50 percent above the seasonal expectancy in the West South Central

section, but in all other regions the incidence was well below the 5-year median.

MORTALITY, ALL CAUSES

For the 4 weeks ended November 4 there were approximately 35,400 deaths from all causes reported to the Bureau of the Census by 93 large cities. The average number reported for the corresponding period in 1941–43 was approximately 33,700 deaths. Each week of the 4-week period showed an increase over the preceding 3-year average, the weekly average increase being 4.6 percent.

DEATHS DURING WEEK ENDED NOVEMBER 4, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov 4, 1944	Corresponding week, 1943
Data for 91 large cities of the United States		
Total deaths	8,902	8,680
Average for 3 prior years	8,450	--
Total deaths, 44 weeks of year	391,861	399,120
Deaths under 1 year of age	669	626
Average for 3 prior years	609	--
Deaths under 1 year of age, 44 weeks of year	27,140	28,850
Data from industrial insurance companies		
Policies in force	66,865,613	66,017,204
Number of death claims	12,864	10,477
Death claims per 1,000 policies in force, annual rate	10 1	8 3
Death claims per 1,000 policies, 44 weeks of year, annual rate	10 0	9 7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 11, 1944

Summary

A total of 314 cases of poliomyelitis was reported, representing a decrease of 30 percent for the week, as compared with a 22-percent decrease last week. The total for the corresponding week last year was 243, and the 5-year (1939–43) median is 191. Of the current total, 232 cases occurred in the 9 States reporting 10 or more cases each, as follows (last week's figures in parentheses): *Increases*—Minnesota 16 (12), Virginia 12 (8), Oregon 10 (2); *decreases*—New York 106 (145), New Jersey 14 (17), Pennsylvania 27 (34), Ohio 19 (31), Illinois 12 (23), Michigan 16 (24). The cumulative total to date is 18,202, as compared with 11,622 for the corresponding period last year. The latter figure proved to be 93 percent of the total for that year. During the period June 25 to date the weekly figures have been continuously above those of last year, and the cumulative figures for that period of the two years are, respectively, 17,422 and 10,717.

The total of 153 reported cases of meningococcus meningitis, while lower than for the corresponding week last year, is more than 3 times the 5-year median. The cumulative figure since September 9, the date of the lowest weekly incidence this year, is 1,298 as compared with 1,774 for the same period last year and a 5-year median of 278 for the corresponding periods of the years 1938–42.

The current reports of diphtheria, influenza, smallpox, typhoid fever, and whooping cough are below the respective figures for both last week and the 5-year median.

For the ninth consecutive week the incidence of measles is lower than for the corresponding week of any of the past 5 years. The cumulative total for this period is 4,438, as compared with a median of 10,133 for the corresponding periods of the past 5 years. For the entire year to date the weekly incidence of whooping cough has been constantly below that of any of the past 5 years. The cumulative total is 82,789, as compared with a 5-year median of 155,529.

A total of 8,607 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,968 last week and a 3-year (1941–43) average of 8,568. The cumulative figure is 403,799, as compared with 411,025 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended November 11, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria: Week ended— Nov 11 1944	Diphtheria: Week ended— Nov 13 1943	Diphtheria: Median 1939–43	Influenza: Week ended— Nov 11 1944	Influenza: Week ended— Nov 13 1943	Influenza: Median 1939–43	Measles: Week ended— Nov 11 1944	Measles: Week ended— Nov 13 1943	Measles: Median 1939–43	Meningitis, meningococcus: Week ended— Nov 11 1944	Meningitis, meningococcus: Week ended— Nov 13 1943	Meningitis, meningococcus: Median 1939–43
NEW ENGLAND												
Maine	0	0	1				0	5[illegible]	54	0	0	0
New Hampshire	0	0	0				50	12	4	0	1	0
Vermont	0	0	0				3	0	3	0	0	0
Massachusetts	6	6	3				105	166	166	4	6	2
Rhode Island	0	0	0	31			1	[illegible]	6	1	4	0
Connecticut	0	0	0	2	1	3	12	3	6	3	5	1
MIDDLE ATLANTIC												
New York	9	16	16	[1] 2	[1] 3	[1] 6	[illegible]	[illegible]40	171	21	33	4
New Jersey	6	4	5	2	2	4	12	188	[illegible]	4	14	2
Pennsylvania	9	1	15	1	2		25	169	207	13	21	4
EAST NORTH CENTRAL												
Ohio	11	7	19	8	4	5	7	4[illegible]5	30	8	12	0
Indiana	4	7	15	12	45	6	[illegible]	106	7	7	3	1
Illinois	3	11	24	1	9	9	12	36	36	13	8	1
Michigan [2]	21	5	10	2	87	1	8	352	160	11	17	2
Wisconsin	0	6	1	14	18	21	14	404	95	2	1	1
WEST NORTH CENTRAL												
Minnesota	9	10	1			1	5	420	31	3	2	1
Iowa	7	3	3				18	3	20	1	0	0
Missouri	4	6	6	1	3	2	0	3	5	2	11	0
North Dakota	3	4	3			4	2	210	6	0	0	0
South Dakota	2	3	3				1	11	4	0	0	0
Nebraska	1	4	4	15	5	1	6	5	5	0	0	0
Kansas	6	2	2			4	5	3	9	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0				2	17	1	1	3	0
Maryland [2]	8	7	11	4		1	3	23	9	3	5	2
District of Columbia	0	0	0	1	2	2	1	11	1	2	2	0
Virginia	19	11	28	175	107	114	6	208	23	2	11	2
West Virginia	4	6	14	6		9	24	16	8	3	2	1
North Carolina	39	21	59	3	2	2	7	42	42	0	6	1
South Carolina	10	12	23	231	305	239	3	52	9	0	4	2
Georgia	18	26	26	22	19	31	3	23	5	0	3	0
Florida	6	12	5	2	11	2	1	5	4	5	4	0
EAST SOUTH CENTRAL												
Kentucky	12	9	10	8	3	4	1	13	13	4	6	1
Tennessee	19	13	14	24	15	22	3	12	12	7	5	2
Alabama	35	26	28	16	52	49	2	23	12	5	1	1
Mississippi [2]	33	5	15							3	3	1
WEST SOUTH CENTRAL												
Arkansas	10	6	15	21	26	26	1	4	5	0	0	0
Louisiana	18	7	12	3	11	11	1	1	1	1	1	1
Oklahoma	11	5	12	21	38	38	3	12	1	0	4	0
Texas	55	62	57	562	630	523	15	27	29	6	5	3
MOUNTAIN												
Montana	1	2	2		1	1	2	78	8	0	0	0
Idaho	1	2	0				0	5	5	1	1	0
Wyoming	1	0	1	23	2	2	0	7	7	0	0	0
Colorado	4	17	16	19	15	21	5	52	20	0	2	0
New Mexico	5	0	1	1			0	0	0	0	0	0
Arizona	0	3	3	54	116	76	1	1	2	1	1	0
Utah [2]	0	0	0			3	11	1	9	0	0	0
Nevada	0	0	0		3		0	4	0	0	0	0
PACIFIC												
Washington	5	23	3			1	22	45	45	1	4	1
Oregon	4	2	2	8	6	7	25	34	15	4	1	0
California	23	26	23	14	12	22	135	35	41	11	11	4
Total	442	398	551	1 309	1 555	1 555	594	3 688	2,003	153	223	41
45 weeks	11,194	11,513	13,073	350,488	94,209	159 002	597,152	557,876	478,155	14,781	15,796	1,768

[1] New York City only

[2] Week ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended November 11, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Poliomyelitis: Week ended— Nov. 11, 1944	Poliomyelitis: Week ended— Nov. 13, 1943	Poliomyelitis: Median 1939–43	Scarlet fever: Week ended— Nov. 11, 1944	Scarlet fever: Week ended— Nov. 13, 1943	Scarlet fever: Median 1939–43	Smallpox: Week ended— Nov. 11, 1944	Smallpox: Week ended— Nov. 13, 1943	Smallpox: Median 1939–43	Typhoid and paratyphoid fever [3]: Week ended— Nov. 11, 1944	Typhoid and paratyphoid fever [3]: Week ended— Nov. 13, 1943	Typhoid and paratyphoid fever [3]: Median 1939–43
NEW ENGLAND												
Maine	0	0	0	21	15	8	0	0	0	0	0	1
New Hampshire	0	0	0	2	1	9	0	0	0	0	0	0
Vermont	0	0	0	6	14	5	0	0	0	0	1	0
Massachusetts	9	10	2	145	142	142	0	0	0	1	1	1
Rhode Island	0	2	0	12	8	8	0	0	0	0	1	1
Connecticut	5	1	1	38	23	22	0	0	0	0	1	0
MIDDLE ATLANTIC												
New York	106	17	17	163	239	173	0	0	0	3	7	7
New Jersey	14	1	5	53	62	65	0	0	0	1	1	1
Pennsylvania	27	1	6	186	153	152	0	0	0	6	5	8
EAST NORTH CENTRAL												
Ohio	19	2	5	407	223	205	0	0	0	3	2	5
Indiana	0	1	2	47	53	57	0	1	1	2	0	1
Illinois	12	26	15	159	107	170	0	1	1	0	3	3
Michigan [2]	16	4	6	128	105	105	0	1	1	1	2	2
Wisconsin	2	7	7	50	116	116	0	2	2	0	0	0
WEST NORTH CENTRAL												
Minnesota	16	1	8	37	64	64	0	0	0	1	0	0
Iowa	2	1	2	43	54	50	1	0	0	0	4	1
Missouri	9	3	1	39	48	48	0	0	0	2	2	2
North Dakota	0	5	0	7	8	8	0	0	0	0	0	0
South Dakota	0	0	3	9	12	18	0	0	0	1	0	1
Nebraska	0	3	3	40	32	15	1	0	0	0	0	0
Kansas	2	11	3	79	94	71	0	2	0	1	0	2
SOUTH ATLANTIC												
Delaware	3	0	0	7	2	4	0	0	0	0	0	0
Maryland [2]	7	0	0	96	40	38	0	0	0	1	0	4
District of Columbia	0	0	0	14	15	14	0	0	0	0	1	0
Virginia	12	2	2	76	54	56	0	0	0	1	1	5
West Virginia	3	1	1	98	84	62	1	0	0	2	1	1
North Carolina	4	0	1	92	130	116	0	0	0	2	3	2
South Carolina	0	0	0	11	10	20	0	0	0	1	2	3
Georgia	0	1	1	33	31	32	0	0	0	4	1	3
Florida	1	0	1	5	12	8	0	0	0	2	0	2
EAST SOUTH CENTRAL												
Kentucky	9	6	6	49	44	57	0	0	0	2	3	6
Tennessee	2	0	0	89	55	92	0	0	0	2	3	6
Alabama	2	0	1	45	22	24	0	0	0	2	2	2
Mississippi [2]	2	2	2	20	4	12	0	0	0	5	1	1
WEST SOUTH CENTRAL												
Arkansas	0	3	1	13	8	9	0	0	0	2	8	8
Louisiana	1	0	0	14	14	11	0	0	0	2	4	5
Oklahoma	2	14	2	30	58	17	0	0	0	2	1	1
Texas	3	9	4	67	55	47	0	0	0	10	9	13
MOUNTAIN												
Montana	1	2	0	17	34	26	0	0	0	0	2	0
Idaho	1	0	2	35	11	11	0	0	0	0	1	1
Wyoming	0	0	0	10	1	6	0	0	0	0	0	0
Colorado	0	6	2	47	27	32	1	0	0	0	3	2
New Mexico	1	2	0	18	15	7	0	0	0	2	0	0
Arizona	0	0	0	11	10	1	0	0	0	5	1	1
Utah [2]	1	7	3	12	28	17	0	0	0	0	0	0
Nevada	0	3	0	3	3	1	0	0	0	0	0	0
PACIFIC												
Washington	6	8	1	41	58	52	0	1	1	1	0	0
Oregon	10	19	0	30	59	15	0	0	0	1	0	0
California	4	62	17	191	152	109	0	0	0	3	3	3
Total	314	243	191	2,845	2,609	2,518	4	8	9	74	80	116
45 weeks	18,202	11,622	8,361	165,835	118,943	118,943	344	663	1,257	4,955	4,990	7,694

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: New York 1, New Jersey 1, Georgia 3, Florida 1, Texas 1, New Mexico 1, California 1.

Telegraphic morbidity reports from State health officers for the week ended November 11, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Whooping cough			Week ended November 11, 1944								
	Week ended—		Median 1939–43	Anthrax	Dysentery			Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
	Nov 11, 1944	Nov 13, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	25	6	43	0	0	0	0	0	0	0	0	0
New Hampshire	0	3	3	0	0	0	0	0	0	0	0	0
Vermont	31	34	34	0	0	0	0	0	0	0	0	0
Massachusetts	95	41	172	0	0	5	0	0	0	0	0	0
Rhode Island	2	22	21	0	0	0	0	0	0	0	0	0
Connecticut	54	57	70	0	0	1	0	1	0	0	0	0
MIDDLE ATLANTIC												
New York	166	257	450	0	2	7[illegible]	0	2	0	0	0	1
New Jersey	69	96	137	0	1	0	0	0	0	0	0	0
Pennsylvania	139	145	279	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	189	153	173	0	0	0	0	0	0	1	1	0
Indiana	21	11	13	0	0	0	0	0	0	0	0	0
Illinois	76	122	155	0	7	0	0	0	0	0	2	0
Michigan [2]	47	180	232	0	1	4	0	0	0	0	0	0
Wisconsin	6	191	191	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	32	54	54	0	0	6	0	0	0	0	0	0
Iowa	0	24	24	0	0	0	0	0	0	0	0	0
Missouri	14	12	11	0	0	0	1	0	0	0	0	0
North Dakota	8	20	9	0	0	0	0	0	0	0	0	0
South Dakota	3	27	6	0	0	0	1	0	0	0	0	0
Nebraska	6	8	8	0	0	0	0	0	0	0	0	0
Kansas	14	15	17	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	1	1	0	0	0	0	0	0	0	0	0
Maryland [2]	55	51	52	0	0	0	0	0	0	0	0	0
District of Columbia	1	15	12	0	0	[illegible]	0	0	0	0	0	0
Virginia	26	80	59	0	0	6	78	0	0	0	0	1
West Virginia	7	16	16	0	0	0	0	0	0	0	1	0
North Carolina	37	190	113	0	0	0	0	0	0	0	0	3
South Carolina	25	17	20	0	2	21	0	0	0	0	0	2
Georgia	18	5	9	0	0	0	0	0	0	0	0	31
Florida	17	0	10	0	1	0	0	0	0	0	0	10
EAST SOUTH CENTRAL												
Kentucky	47	88	79	0	0	1	0	0	0	0	0	0
Tennessee	40	11	27	0	1	0	4	0	0	2	4	4
Alabama	5	17	9	0	0	0	0	0	0	0	0	11
Mississippi				0	0	0	0	0	0	0	1	2
WEST SOUTH CENTRAL												
Arkansas	26	13	16	0	0	26	0	0	0	0	0	0
Louisiana	3	6	6	0	0	0	0	0	0	0	0	8
Oklahoma	3	0	4	0	0	0	0	0	0	0	0	0
Texas	134	81	85	0	8	340	12	0	0	0	1	33
MOUNTAIN												
Montana	2	0	4	0	0	0	0	0	0	0	1	0
Idaho	3	5	4	0	0	0	0	0	0	0	0	0
Wyoming	12	2	3	0	0	0	0	0	0	0	0	0
Colorado	14	36	17	0	1	0	0	2	0	0	0	0
New Mexico	1	4	7	0	0	15	2	0	0	0	0	0
Arizona	14	18	9	0	2	0	24	0	0	0	0	0
Utah [2]	11	26	27	0	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	7	83	37	0	0	0	0	0	0	0	0	0
Oregon	7	18	18	0	0	0	0	0	0	0	0	0
California	93	96	142	0	2	9	0	1	0	0	0	1
Total	1,661	2,367	2,998	0	28	503	122	7	0	3	11	102
Same week 1943	2,367			2	48	391	151	13	1	1	2	104
Same week 1942	2,998			0	17	188	78	12	0	1	10	87
45 weeks 1944	82,789			38	1,612	21,043	7,869	577	27	450	489	4,528
45 weeks 1943	161,574			60	1,856	14,628	6,910	610	25	428	708	3,820
45 weeks 1942	155,529		[4] 155,529	71	1,065	11,197	6,101	512	42	[4] 450	758	[4] 2,539

[2] Period ended earlier than Saturday.

[4] 5-year median, 1939–43

WEEKLY REPORTS FROM CITIES

City reports for week ended November 4, 1944

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0		0	3	0	2	0	7	0	0	0
New Hampshire												
Concord	0	0		0	0	0	1	1	0	0	0	0
Massachusetts												
Boston	0	0		0	42	3	11	7	39	0	0	23
Fall River	0	0		0	0	1	0	0	3	0	0	0
Springfield	0	0		0	1	2	0	0	1	0	0	1
Worcester	0	0		0	0	0	9	0	6	0	0	4
Rhode Island												
Providence	1	0		0	0	0	2	0	4	0	0	30
Connecticut												
Bridgeport	0	0		0	0	0	0	1	1	0	0	0
Hartford	0	0		0	5	0	4	0	2	0	0	5
New Haven	1	0		0	0	1	0	0	1	0	0	20
MIDDLE ATLANTIC												
New York												
Buffalo	0	0		0	0	2	8	11	3	0	0	0
New York	8	0	5	2	6	12	81	42	88	0	7	83
Rochester	0	0		0	10	0	6	12	2	0	0	18
Syracuse	0	0		0	0	0	0	2	6	0	0	5
New Jersey												
Camden	0	0		0	0	0	3	0	2	0	0	1
Newark	0	0	1	0	5	0	7	0	8	0	0	7
Trenton	0	0	1	0	0	0	2	1	0	0	0	0
Pennsylvania												
Philadelphia	0	0	5	2	4	2	18	3	46	0	1	23
Pittsburgh	0	0		0	0	2	14	3	11	0	1	16
Reading	0	0		0	1	0	2	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	4	0		0	0	2	2	4	11	0	0	7
Cleveland	0	0	2	1	0	5	7	5	28	0	0	12
Columbus	0	0		0	0	0	0	0	4	0	0	7
Indiana												
Fort Wayne	0	0		0	0	0	0	0	3	0	0	0
Indianapolis	2	0		0	0	3	6	0	11	0	0	1
South Bend	0	0		0	1	1	0	0	3	0	0	0
Terre Haute	0	0		0	0	0	4	0	0	0	0	0
Illinois												
Chicago	0	0		2	9	3	22	2	43	0	2	29
Springfield	0	0		0	2	1	0	0	1	0	0	0
Michigan												
Detroit	17	1	1	0	4	5	13	6	40	0	1	12
Flint	0	0		0	0	0	0	0	0	0	0	0
Grand Rapids	0	0		0	0	0	0	1	14	0	0	0
Wisconsin												
Kenosha	0	0		0	0	0	0	0	1	0	0	6
Milwaukee	0	0		0	2	4	8	0	9	0	0	14
Racine	0	0		0	0	0	0	0	0	0	0	5
Superior	0	0		0	3	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0		0	1	0	1	2	6	0	0	6
Minneapolis	24	0		0	1	1	3	5	8	0	0	3
St Paul	0	0		0	1	1	5	2	9	0	0	13
Missouri												
Kansas City	1	0		0	0	1	6	0	6	0	1	0
St Joseph	0	0		0	0	0	0	0	1	0	0	0
St Louis	0	0		0	1	4	13	10	5	0	0	6

City reports for week ended November 4, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—Continued												
North Dakota:												
Fargo	0	0	----	0	0	0	2	0	0	0	0	0
Nebraska:												
Omaha	0	0		0	3	1	4	0	6	0	0	0
Kansas:												
Topeka	0	0	---	0	0	0	0	0	2	0	0	1
Wichita	0	0	------	0	1	0	3	0	5	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	0	0	0	0	0	0
Maryland:												
Baltimore	2	0	1	1	0	4	10	6	22	0	0	53
Cumberland	0	0	-----	0	0	0	0	0	5	0	0	0
Frederick	0	0	---	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	2	1	2	2	7	0	20	0	1	6
Virginia:												
Richmond	2	0	1	1	0	0	2	0	9	0	0	0
Roanoke	0	0	------	0	0	0	1	1	2	0	0	0
West Virginia:												
Wheeling	0	0		0	0	0	1	0	4	0	0	3
North Carolina:												
Raleigh	0	0	--	0	0	0	0	0	0	0	0	1
Wilmington	2	0	-----	0	2	0	0	0	6	0	0	0
Winston-Salem	0	0	----	0	0	0	1	0	5	0	0	0
South Carolina:												
Charleston	1	0	8	0	0	0	0	1	2	0	0	1
Georgia:												
Atlanta	0	0	11	0	0	0	3	0	5	0	0	1
Brunswick	0	0	--	0	0	0	1	0	0	0	0	0
Savannah	0	0	2	0	0	0	0	0	0	0	0	0
Florida:												
Tampa	5	0		0	0	0	3	2	4	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	6	0		1	3	0	5	1	10	0	0	2
Nashville	0	0	--	0	0	0	2	0	6	0	0	0
Alabama:												
Birmingham	0	0	1	1	0	0	2	0	0	0	0	0
Mobile	1	0	0	0	0	0	2	0	2	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	----	0	0	0	1	0	2	0	0	2
Louisiana:												
New Orleans	4	0	------	0	0	1	7	2	4	0	4	0
Shreveport	2	0	-----	1	0	0	2	0	1	0	0	0
Texas:												
Dallas	6	0	------	0	1	0	7	0	5	0	0	3
Galveston	0	0	------	0	0	0	1	0	6	0	0	0
Houston	5	0	------	0	1	0	5	1	4	0	2	0
San Antonio	3	0	------	0	0	0	3	0	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	0	1	0	0	3
Great Falls	0	0	------	0	0	0	1	0	2	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	2	0	1	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	2	0	2	0	3	0	6	0	9	0	0	0
Pueblo	0	0	------	0	0	0	0	0	1	0	0	0

City reports for week ended November 4, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	0	0		0	4	0	3	0	8	0	0	0
Spokane	1	0		0	6	0	0	0	2	0	1	0
Tacoma	1	0		0	2	0	0	0	4	0	0	0
California												
Sacramento	0	0		0	1	0	1	0	2	0	0	0
San Francisco	0	0	1	0	22	1	4	1	14	0	0	11
Total	101	1	44	13	155	65	352	135	614	0	21	449
Corresponding week, 1943	70		56	25	645		324		655	0	13	596
Average, 1939–43	89		62	[1] 21	[2] 466		[1] 325		617	1	22	919

Dysentery, amebic—Cases Boston, 4, Philadelphia, 1, Chicago, 7, Baltimore, 3

Dysentery, bacillary Cases Providence, 5, Buffalo, 38, New York, 42, Rochester, 1, Syracuse, 3, Cleveland, 1, Detroit, 2, Baltimore, 2, Charleston, S C , 4, Nashville, 1, Dallas, 1, San Francisco, 2

Dysentery, unspecified—Cases Richmond, 2

Rocky Mountain spotted fever—Cases New York 1

Typhus fever —Cases Charleston, S C , 1, Atlanta, 1, Savannah, 4, Tampa, 4, Mobile, 1, New Orleans, 2, Shreveport, 1, Dallas, 1, Galveston, 2, Houston, 5, San Antonio, 2

[1] 3-year average, 1941–43
[2] 5-year median, 1939–43

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1943, 32,402,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.3	0.0	0.0	0.0	134	18.4	76.1	23.6	168	0.0	0.0	218
Middle Atlantic	3.7	0.0	5.6	1.9	12	8.3	65.3	34.3	77	0.0	4.2	71
East North Central	14.0	0.6	1.8	1.8	13	14.6	37.7	10.9	102	0.0	1.8	57
West North Central	49.7	0.0	0.0	0.0	16	15.9	73.6	37.8	95	0.0	2.0	64
South Atlantic	20.4	0.0	42.4	5.1	7	10.2	49.2	17.0	142	0.0	1.7	112
East South Central	41.3	0.0	5.9	11.8	18	0.0	64.9	5.9	106	0.0	0.0	12
West South Central	57.4	0.0	0.0	2.9	6	2.9	74.6	8.6	66	0.0	17.2	14
Mountain	21.1	0.0	21.1	0.0	53	0.0	94.9	0.0	137	0.0	0.0	32
Pacific	6.5	0.0	3.3	0.0	114	3.3	26.1	3.3	98	0.0	3.3	36
Total	16.3	0.2	7.1	2.1	25	10.5	56.8	21.8	99	0.0	3.4	72

PLAGUE INFECTION IN TACOMA, WASH.

Plague infection has been reported proved in fleas and tissue from rats, *R. norvegicus*, taken at the waterfront in Tacoma, Wash., on October 23 and 28, as follows: Spleen from 1 rat and a pool of spleens from 5 rats; a pool of 400 fleas from 22 rats, and a pool of 61 fleas from 46 rats.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—September 1944.—During the month of September 1944, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows.

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	17		2		6		3		28	
Diphtheria	8		1				4		13	
Dysentery (amebic)	3				1		7	1	11	1
Dysentery (bacillary)	3		1		7		2	1	13	1
Leprosy							1	1	1	1
Malaria [1]	7	1	3		83	1	54	4	147	6
Measles			1		4				5	
Mumps	2		1		5		1		9	
Paratyphoid fever	2				5		1		8	
Pneumonia		6		3	33	2		3	[2] 33	14
Poliomyelitis							1	1	1	1
Relapsing fever							2		2	
Tuberculosis		20		2	6			7	[2] 6	29
Typhoid fever	1						1	1	2	1
Whooping cough					2				[2] 2	

[1] 24 recurrent cases.
[2] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 21, 1944.—During the week ended October 21, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		20		108	83	35	10	15	21	292
Diphtheria	1	4	1	47	8	1	2	4	1	69
Dysentery:										
Bacillary				5			1		3	9
Unspecified					1					1
Encephalitis, infectious				1						1
German measles				1	5				7	13
Influenza					4	2			8	14
Measles		2		288	30	23	11	4	24	382
Meningitis, meningococcus				2	1					3
Mumps				140	30		1	14	25	210
Poliomyelitis			1		[1] 18	4	1	4	2	[1] 30
Scarlet fever	1	5	9	67	118	24	5	27	35	291
Tuberculosis (all forms)		2	2	81	46	9	66		15	221
Typhoid and paratyphoid fever				14	1		1		1	17
Undulant fever					1	1				2
Venereal diseases:										
Gonorrhea		45	7	59	93	29	41	40	79	393
Syphilis		13	11	147	84	16	3	12	29	315
Other				1						1
Whooping cough		27		96	36	16	11	38	12	236

[1] Includes 11 cases, delayed reports.

COLOMBIA

Valle Department—Buga—Typhoid fever.—Under date of October 23, 1944, a report from the American Vice Consul states that an epidemic of typhoid fever has occurred in the town of Buga, with a population of about 29,000, in the Department of Valle, Colombia. The number of cases reported early in October was about 300 and at the time of the report was over 500. The mortality rate is about 10 percent. The cause of the spread of the disease has not been definitely established but is thought to be a polluted water supply.

CUBA

Provinces—Notifiable diseases—4 weeks ended October 7, 1944.—During the 4 weeks ended October 7, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1		3	5		12	21
Chickenpox				1		1	2
Diphtheria	1	39	5	3		2	50
Dysentery unspecified		8					8
Hookworm disease		31					31
Leprosy		1					1
Malaria	9	17	6	9	7	160	208
Measles		3		1			4
Scarlet fever		1					1
Tetanus infantile				1			1
Tuberculosis (all forms)	19	32	12	13	4	44	124
Typhoid fever	23	64	17	88	11	42	245
Undulant fever					2		2
Whooping cough			1				1
Yaws						3	3

[1] Includes the city of Habana

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above mentioned diseases, except yellow fever, during the current year All reports of yellow fever are published currently

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month

(Few reports are available from the invaded countries of Europe and other nations in war zones)

Plague

Algeria—Algiers—Information dated November 3, 1944, states that from the beginning of the outbreak in September 1944 up to October 31, 1944, a total of 70 cases of plague (including 25 suspected cases) with 23 deaths has been reported in Algiers, Algeria

French West Africa—Dakar.—For the week ended October 21, 1944, 13 fatal cases of plague were reported in Dakar, French West Africa.

Union of South Africa.—For the period October 1 14, 1944, 2 cases of plague were reported in the Union of South Africa, no specific location being given.

Smallpox

Bolivia.—For the month of September 1944, 154 cases of smallpox with 54 deaths were reported in Bolivia, including 34 cases and 7 deaths reported in the Department of La Paz, 42 cases and 19 deaths reported in the city of La Paz, 21 cases and 11 deaths reported in the Department of Potosi, and 27 cases and 8 deaths reported in the city of Potosi.

Brazil.—For the period January 1 to October 7, 1944, 7,812 cases of smallpox (including 7,521 cases of alastrim) with 12 were deaths

reported in Brazil. These figures include approximately 800 cases in Mauriti, 700 cases in Saboeiros, and 3,000 cases in Senador Pompeu, Ceara State.

Colombia.—For the period January 1 to May 31, 1944, 1,157 cases of smallpox with 11 deaths were reported in Colombia. For the month of June 1944, 256 cases of smallpox with 15 deaths were reported. Departments reporting the highest incidence are: Boyaca, 67 cases, 3 deaths; Valle, 66 cases, 8 deaths; Bolivar, 63 cases; Caldas, 29 cases, 4 deaths; Antioquia, 11 cases; Tolima, 10 cases.

Togo (British Mandated).—For the week ended November 11, 1944, 78 cases of smallpox with 15 deaths were reported in British Mandated Togo.

Union of South Africa—Natal.—For the period May 1 to October 1, 1944, 337 cases of smallpox with 103 deaths were reported in Durban and for the period May 30 to October 2, 1944, 80 cases of smallpox with 26 deaths were reported in Pietermaritsburg, Natal, Union of South Africa.

Typhus Fever

Bolivia.—For the month of September 1944, 25 cases of typhus fever with 5 deaths were reported in Bolivia, including 9 cases and 2 deaths in La Paz city and 12 cases with 3 deaths in the Department of Potosi.

Mexico.—For the month of September 1944, 147 cases of typhus fever were reported in Mexico. States reporting the highest incidence are: Mexico, D. F., 26 cases, Nuevo Leon, 18 cases, Zacatecas, 11 cases.

Yellow Fever

Nigeria—Bukuru.—On August 15, 1944, 1 fatal case of yellow fever was reported in Bukuru, Nigeria.

Venezuela—Tachira State—San Camilo region.—In addition to the number of cases previously reported, for the period July 16 to September 10, 1944, 21 cases of suspected yellow fever with 9 deaths were reported in the region of San Camilo, Tachira State, Venezuela. The disease has attacked lumbermen and sawmill workers in particular. Vaccination has been carried out.

COURT DECISION ON PUBLIC HEALTH

Silicosis held not to be an accidental injury within meaning of workmen's compensation act.—(South Dakota Supreme Court; *Johnson* v. *Concrete Materials Co.*, 15 N.W.2d 4; decided June 16, 1944.) An action for damages was brought against an employer based upon his alleged negligence in failing to provide the plaintiff with a safe place in which to work. It was averred by the plaintiff that, as a result of such negligence, he contracted the occupational disease known as silicosis. The defendant sought the dismissal of the complaint on the theory that it described an injury by accident for which the South Dakota Workmen's Compensation Law supplied the exclusive remedy. The trial court overruled the defendant's motion to dismiss the complaint and the defendant appealed to the State supreme court.

The question presented was whether the complaint described an "injury by accident" within the definition of the workmen's compensation act. This statute defined "injury" or "personal injury" as "only injury by accident arising out of and in the course of the employment, and shall not include a disease in any form except as it shall result from the injury." The appellate court said that the complaint described an injury resulting from repeated inhalations of silica over an extended period of time and held that it did not describe an accidental injury which was only compensable under the workmen's compensation statute. A prior case was referred to in which there was involved an injury resulting from ingesting bacillus botulinus and the court quoted from the opinion as follows: "We are of the view that a disease may be an 'injury by accident' within the meaning of our statute. The exclusion is of any disease which is not an accidental injury or which does not result from such injury. It is generally recognized that accident as contemplated by the workmen's compensation law is distinguished from so-called occupational diseases which are the natural and reasonably to be expected result of workmen following certain occupations for a considerable period of time. On the other hand, if the element of suddenness or precipitancy is present and the disease is not the ordinary or reasonably to be anticipated result of pursuing an occupation, it may be regarded as an injury by accident and compensable."

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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Public Health Reports

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FLUORIDE DOMESTIC WATERS AND SYSTEMIC EFFECTS [1]

II. Fluorine Content of Urine in Relation to Fluorine in Drinking Water

By F. J. McClure, *Senior Biochemist*, and C. A. Kinser, *Associate Chemist*, *United States Public Health Service*

A preceding article (*1*), by one of us (F. J. McC.), reports an epidemiological study of the bone-fracture experience, height, and body weight of high school boys and young men in relation to their exposure to fluorine in drinking water. The fluorine content of urine specimens obtained from a large number of these same men and boys is reported in this article. The urine analyses also are studied in relation to the fluorine content of the local water supply.

Concentrations of fluorine permissible in domestic water and in food are now established at 1.00 p. p. m. in drinking water according to Public Health Service Drinking Water Standards (*2*) and 7.0 p. p. m. in marketable sprayed apples and pears as established by Federal Government restriction. When the concentration of fluorine in a domestic water exceeds approximately 1.5 p. p. m. (associated with an index of dental fluorosis of about 0.6) endemic dental fluorosis as stated by Dean (*3*) "begins to constitute a public health problem warranting increasing consideration." Fluoride ingested in food alone has been found "insufficient to produce even the faintest signs of dental fluorosis in as little as one percent" of a group of over 2,000 white public school children (*4*). Fruits and vegetables carrying fluorine spray residues, while not studied specifically in these regards, have given no evidence of producing dental fluorosis (mottled enamel).

An important effect of fluorine in drinking water is a marked reduction of dental caries attack in children aged 12 to 14 (*4*, *5*). It is quite possible that this effect also applies to older age groups (*6*). These effects are associated with as little as 1.00 p. p. m. fluorine in a domestic water. Absence of endemic dental fluorosis (mottled enamel)

[1] From the Dental Research Section, Division of Physiology, National Institute of Health.

in connection with the domestic use of waters of this fluoride concentration, i. e., 1.00 p. p. m. fluorine (*4*), has made it possible to consider seriously the direct fluorination of communal water supplies in this concentration, for the partial control of dental caries (*7*). Other suggested health hazards which may surround this concentration, and also higher concentrations of fluorine in drinking water, are being investigated in studies such as those reported in this article and in the preceding article (*1*).

The public health hazard possibly connected with the domestic use of fluoride-bearing waters and which seems to deserve most serious study at this time relates to cumulative toxic bone fluorosis (*8*). This form of fluorine toxicity is attributed to the abnormal accumulation of fluorine in skeletal tissues (*8*). In connection with excessive exposures to fluorine from food or drinking water, it appears that the successful adjustment of the body to this fluorine may be largely dependent on the elimination of fluorine via the urinary excretion. For this reason the fluorine content of urine studied in relation to the fluorine exposure may be of special value as a measure of a suspected health hazard related to cumulative bone fluorosis. Urinary fluorine data may also serve as an index of the approximate fluorine exposure from food and drinking water.

Fluorine content of urine of human subjects has been studied most extensively thus far by Machle (*9*), Machle, Scott, and Treon (*10*), Machle, Scott, and Largent (*11*), and Machle and Largent (*12*). Brun, Buchwald, and Roholm (*13*) studied the excretion of fluorine in urine of cryolite factory workers. (Cryolite is the mineral Na_3AlF_6.) Shortt, McRoberts, Barnard, and Nayar (*14*) found fluorine in appreciable quantities in urine of certain natives of India exposed to fluorine in their water supplies.

The results of studies by Machle and his coworkers may be summarized as follows: According to Machle (*9*) fluorine content of urine ranges from 0.5 to 2.89 p. p. m. and averages about 1.00 p. p. m. The specimens analyzed were provided by 10 women and 19 children who were hospital patients, and by 101 subjects chosen at random. Based on a rather limited number of specimens, Machle, Scott, and Treon (*10*) report an appreciable elevation of fluorine in urine where there is an exposure to fluorine in the drinking water. In an experimental study (*11*), a normal man was found to remain in a normal or noncumulative fluorine balance when ingesting 0.4 mg. to 0.6 mg. of fluorine daily. "Measurable storage of fluorine did not occur. Over 80 percent of the fluorine was absorbed and excreted in the urine" (*11*). An equilibrium between fluorine ingestion and output was further demonstrated by these workers "under normal levels of fluoride intake," i. e., at about 0.5 mg. fluorine ingested daily (*11*). Increasing the daily fluorine intake by addition of 6.0 mg. of fluorine to the ingesta

caused an increase in the urinary excretion of fluorine. However, this increased urinary excretion did not bring about the elimination of all the absorbed fluorine (ingesta fluorine minus feces fluorine). A body storage of fluorine occurred, therefore, estimated as follows in milligrams of fluorine retained daily: From sodium fluoride in drinking water, 3.87 mg.; from bone meal 1.74 mg.; and from cryolite 2.43 mg. As noted above, in these comparative tests an equal quantity (6.0 mg. daily) of fluorine was provided by each fluorine compound. The observed differences in daily retention were due mainly to differences in quantities absorbed rather than to a variability in the percent of absorbed fluorine excreted in the urine.

Fluorine content of urine, according to Brun, Buchwald, and Roholm (*13*), will normally average 0.80 p. p. m., varying from 0.3 to 1.6 p. p. m. Average daily excretion equals 0.92 mg., varying from 0.18 to 1.85 mg. daily. These results are based on 24-hour urine collections from 30 hospital patients aged 2 months to 78 years Twenty-four workers exposed to cryolite-factory dust had an average of 16 p. p. m. of fluorine in urine specimens excreted between 8 a. m. and 2:30 p. m. at the factory. These analyses varied from 2.4 to 43.4 p. p. m. fluorine and seemed proportional to exposure to cryolite dust. In this connection it is interesting to note that men who had remained away from these factories as long as 5 to 7 years, after working in the factories 24 to 28 years, continued to show as much as 3.7 to 3.9 p. p. m. fluorine in urine specimens. In these men fluorine was undoubtedly being mobilized from skeletal fluorine acquired during previous fluorine exposure from cryolite dust.

PLAN OF STUDY

With the assistance of induction center personnel, urine specimens were obtained from young adult men reporting for physical examination at Army induction centers, located at Fort Myer, Va. (Washington, D. C., area), Manchester, N. H., Indianapolis, Ind., Chicago, Ill., Oklahoma City, Okla., and Lubbock, Tex. Specimens were obtained from high school boys aged 15 to 17, residing in Washington, D. C., Little Rock, Ark., Oklahoma City, Okla., Lubbock, Tex., Amarillo, Tex., and in the following Illinois cities: Waukegan, Quincy, Elgin, Aurora, Monmouth, and Galesburg. As a rule, specimens were obtained between 9 a. m. and noon. Equal volumes, usually 20 cc., of each specimen were pooled (15 to 20 or less specimens per pooled sample), according to age or duration of fluorine exposure. These samples were preserved with toluene and shipped to the National Institute of Health, U. S. Public Health Service, Bethesda, Md., for fluorine analysis.

The fluorine exposure via drinking water of the majority of these men and boys has been discussed somewhat in detail in the previous

report on the bone-fracture experience, height, and body weight of these men and boys (1). This report should be consulted for details of fluorine exposures. In connection with the study of high school boys, a sample of the local water supply was obtained at the time of the survey. The fluorine content of these waters appears in table 2. Current water samples from a number of communities in which the inductees resided also were analyzed for fluorine, and these results appear in table 1 along with the analytical figures for fluorine in urines.

DETERMINATION OF FLUORINE

The volume of urine for fluorine determination was 100 ml., with the exception that 50 or 25 ml. were taken if the fluorine content was expected to be considerably above normal. The rule followed was to have preferably 50 to 100 micrograms of total fluorine in the analytical sample. Although 100-ml. quantities of urines from nonfluoride areas

TABLE 1.—*Fluorine content of urine. Pooled specimens from men taking physical examination at armed forces induction centers located in fluoride and nonfluoride areas*

Location	Date (1943)	Fluorine in water (p. p. m.)	Fluorine in urine (p. p. m.)	Number of specimens pooled	Comment
NONFLUORIDE AREAS					
Washington, D. C	May 21	0.0	0.3	22	Men aged 17 to 28 reporting at the Ft. Myer, Va., induction center. Lifetime residence in Washington, D. C., or suburbs.
	May 22	0	.4	22	
	May 24	0	.3	28	
	May 25	0	.5	27	
	May 26	0	.4	27	
	May 27	0	.4	27	
	May 28	0	.6	21	
	May 29	0	.4	28	
Indianapolis, Ind.	June 12	.2	.5	24	Men aged 17 to 27 reporting at Indianapolis, Ind., induction center. Lifetime residence in Indianapolis.
	June 12	.2	4	18	
	June 14	2	.5	19	
	June 16	2	.3	22	
	June 16	.2	.3	20	
	June 19	.2	.3	18	
Hendricks County, Ind	June 15	[1] 0.6-1.8	1.0	18	Men aged 18 to 25 reporting at Indianapolis induction center. Lifetime residence in respective county or town.
Jay County, Ind	June 15	[2] 0.7-1.1	.8	21	
Anderson, Ind	June 16	.3	.3	26	
Lebanon, Ind	June 17	.7	.9	18	
Whiting, Ind	June 18	.1	.4	26	
Chicago, Ill	Nov. 13	0	.3	19	Men aged 18 to 31 reporting at Chicago induction center. Lifetime residence in Chicago.
	Nov. 13	0	.3	17	
	Nov. 16	0	.2	24	
Lebanon, N. H	Sept. 1	0	.3	25	Men aged 17 to 30 reporting to New Hampshire induction center. Lifetime residence in respective communities.
Keene, N. H	Sept. 1	0	.2	25	
Nashua, N. H	Sept. 2	0	.2	24	
Lancaster, N. H	Sept. 2		.4	25	
Manchester, N. H	Sept. 3	0	.4	25	
Laconia, N. H	Sept. 3	0	.2	25	
Newport, N. H	Sept. 3	0	.2	25	

[1] Fluorine analyses of waters of Hendricks County towns are reported by Jeup (28) as follows: Brownsburg 0.7 p. p. m., North Salem 1.0 p. p. m., Pittsboro 0.6 p. p. m. Danville water contains (November 1943) 1.8 p. p. m. fluorine (F. J. Mc.).

[2] Jay County towns.—Fluorine analyses are reported by Jeup (28) as follows: Portland 1.0 p. p. m., Dunkirk 0.9 p. p. m., Pennville 1.1 p. p. m. Portland water contains (November 1943) 0.7 p. p. m. fluorine (F. J. Mc.).

TABLE 1.—*Fluorine content of urine. Pooled specimens from men taking physical examination at armed forces induction centers located in fluoride and nonfluoride areas*—Continued

Location	Date (1943)	Fluorine in water (p. p. m.)	Fluorine in urine (p. p. m.)	Number of specimens pooled	Comment
FLUORIDE AREAS					
Amarillo, Tex	July 6	[3] 4.3-5.1	3 9	27	Men aged 18 to 34. 1 year in Amarillo.
	July 17	4 3-5 1	4 0	15	Men aged 18 to 35. 1 year in Amarillo.
Lubbock, Tex	July 7	3.8	4 2	21	Men aged 16 to 21. 1 month to 1 year in Lubbock (Texas Technical College students);
	July 8	3.8	4.2	1	man aged 19, lifetime in Lubbock.
Lubbock Army Air Field	July 15	5 1	4 8	12	Men aged 17 to 34. 12 to 19 months at Air Field.
	July 15	5.1	3.8	7	Men aged 21 to 46. 8 to 11 months at Air Field.
	July 15	5.1	3.7	6	Men aged 22 to 37. 2 to 3 months at Air Field.
	July 15	5.1	3.6	25	Men aged 17 to 46. 2 to 12 months at Air Field.
Lamesa, Tex	July 12	[4] 3 9	4 5	11	Men aged 18 to 35 years reporting at Lubbock, Tex., induction center. 1-year residence in respective county or town.
Levelland, Tex	July 17	[4] 3 5	4 8	6	
Gaines County, Tex	July 9		3 7	7	
Dallam County, Tex	July 13		4 0	12	
Hutchinson County, Tex	July 8		4.0	12	
Pampa, Tex	July 9	[4] .8	3.7	15	
Clarendon, Tex	July 7	[4] .2	3 3	19	
Wheeler, Tex	July 8	[4] 3	2 3	18	
Wellington, Tex	July 16	[4] .4	3.0	8	
Lubbock Glider Field	July 17	2.0	2 0	8	Men aged 20 to 35. 1 to 4 months at Glider Field
	July 17	2 0	1.9	8	Men aged 22 to 36 1 to 4 months at Glider Field.
Joliet, Ill	Nov. 13	1 3	1 0	21	Men aged 22 to 37 (entire life in Joliet).[5]

[3] Amarillo city water (August and September 1943) analyses by J. C. Wyatt, City Chemist, Amarillo, Tex.

[4] It should be noted particularly that these men, although exposed to these waters at home, as a general rule arrived in Lubbock, Tex., the afternoon or evening prior to the morning on which the urine specimens were obtained. During their stay in Lubbock they were exposed to Lubbock drinking water, which contained 3.8 p. p. m. fluorine The rapid response of urinary fluorine to fluorine ingested in drinking water is shown by the data in table 3.

[5] These men were taking the physical examination at the Chicago, Ill, induction center, and were in Chicago several hours at least prior to obtaining these urine specimens. Chicago drinking water is fluoride-free.

contained only 25 to 50 micrograms, these quantities were determined with the desired accuracy. The urine sample was made slightly alkaline with sodium hydroxide, 2.5 ml. of 5-percent magnesium acetate added, the sample evaporated to dryness in a platinum dish, and then ashed at 500° C. Moistening the ash with water, drying, and ashing again facilitates the ashing process. This ashed sample was transferred to a 50-ml. Claissen flask containing a glass bead and a pinch of silica, using water and 5 or 6 ml. of 60-percent perchloric acid. Total volume of washing water and perchloric acid amounted to about 15 ml. The sample was thoroughly disintegrated and a solution of silver perchlorate (1.0 gm. per ml.) added slowly to precipitate chlorides. This addition of silver perchlorate was roughly quantita-

Table 2—*Fluorine content of urine Pooled specimens from high school boys exposed to drinking waters containing different quantities of fluorine*

Location	Date	Fluorine in water (p p m)[1]	Fluorine in urine (p p m)	Number of specimens pooled	Comment
	1943				
Amarillo, Tex	July 17	4.3-5.1	4.6	[illegible]	Boys aged 16 to 18 3 to 17 years in Amarillo
Lubbock, Tex	July 14	3.8	3.5	15	Boys aged 16 to 18 11 years in Lubbock
	July 14	3.8	4.2	11	Boys aged 16 to 18 1 to 5 years in Lubbock
	July 14	3.8	8	26	Boys aged 16 to 18 6 to 18 years in Lubbock
Galesburg Ill	Oct 20	1.9	2.0	17	Boys aged 15 to 17 who had lived practically their entire lives in Galesburg
	Oct 20	1.9	1.5	9	
	Oct 20	1.9	1.7	17	
	Oct 20	1.9	2.0	15	
	Oct 21	1.9	2.1	16	
	Oct 21	1.9	2.0	18	
	Oct 21	1.9	1.6	15	
	Oct 28	1.9	1.8	25	Boys aged 13 to 16 Entire life spent in Galesburg
	Oct 28	1.9	1.2	21	
	Oct 28	1.9	2.2	20	
Monmouth Ill	Nov 1	1.7	1.4	14	Boys aged 15 to 17 Entire life in Monmouth
	Nov 2	1.7	1.5	18	
	Oct 29	1.7	1.7	20	Boys aged 14 to 17 Entire life spent in Monmouth
	Oct 29	1.7	1.4	15	
	Nov 1	1.7	1.3	20	Boys aged 15 to 17 Lifetime in Monmouth or Monmouth area[2]
	Nov 1	1.7	1.1	23	
	Nov 2	1.7	1.2	21	
	Nov 2	1.7	1.1	25	
Aurora, Ill	Nov 4	1.0	8	25	Boys aged 15 to 17 Practically entire life spent in Aurora
	Nov 4	1.0	9	25	
	Nov 4	1.0	9	25	
	Nov 5	1.0	1.1	28	
	Nov 5	1.0	9	25	
	Nov 5	1.0	7	25	
	Nov 5	1.0	1.0	20	
Elgin, Ill	Nov 8	7	6	21	Boys aged 15 to 17 Practically entire life spent in Elgin
	Nov 8	7	4	23	
	Nov 9	7	7	20	
	Nov 9	7	6	24	
	Nov 9	7	7	22	
	Nov 10	7	9	24	
	Nov 10	7	8	24	
Oklahoma City, Okla	July 22	5	6	26	Boys aged 16 to 17 12 years in Oklahoma City
Quincy Ill	Oct 25	1	6	16	Boys aged 15 to 17 Lifetime residence in Quincy
	Oct 25	1	4	11	
	Oct 25	1	2	20	
	Oct 26	1	2	14	
	Oct 26	1	2	24	
Waukegan, Ill	Nov 12	0	4	20	Boys aged 15 to 17 Lifetime residence in Waukegan
	Nov 12	0	6	22	
	Nov 15	0	5	20	
	Nov 15	0	4	25	
	Nov 15	0	4	17	
	Nov 16	0	3	17	
	Nov 16	0	3	21	
Little Rock Ark	July 27	0	3	26	Boys aged 16 to 18 12 years in Little Rock
	1944				
Washington, D C	Jan 4	0	3	22	Boys aged 15[3]
	Jan 5	0	2	22	Boys aged 16[3]
	Jan 6	0	2	23	Boys aged 17[3]

[1] These figures are for samples of water taken from the high school tap at the time the urine specimens were obtained

[2] Several of the boys in these groups lived outside the city limits and their drinking water exposures were not ascertained

[3] These boys had spent their entire lives in Washington, D C.

tive, i. e., until all the chloride in the sample appeared to be precipitated. A slight excess of silver perchlorate, however, has not been found to interfere with the determination (*15*). The fluorine was steam distilled from this mixture, 150 ml. being distilled, the distillate kept alkaline to phenophthalein with 5 ml. of 0.10 normal sodium hydroxide. This volume was distilled over in about one-half hour. Some bumping may occur during the early stages of this distillation but can be kept under control so as not to interfere with the determination. The 150 ml. of distillate was evaporated in a platinum dish almost to dryness, made slightly acid, and transferred to a 10-ml. volumetric flask. A one-fifth or one-tenth aliquot of this solution was then titrated with standard thorium nitrate. This is essentially the method of Willard and Winter (*16*) modified by Armstrong (*17*). A study of this method by McClure (*15*) has been reported. The accuracy of this procedure with respect to urine samples is approximately ± 0.2 p. p. m. The recovery of known quantities of fluorine added to 100-ml. volumes of urine was as follows:

Fluorine present		Fluorine added		Fluorine found		Recovered
Micrograms	p. p. m.	Micrograms	p. p. m.	Micrograms	p. p. m.	Percent
40.0	0.4	20	0.2	70	0.7	117
30.0	.3	20	.2	45	.5	90
40.0	.4	50	.5	70	.7	78
30.0	.3	50	.5	87	.9	106
40.0	.4	80	.8	120	1.2	100
40.0	.4	100	1.0	150	1.5	107
30.0	.3	100	1.0	117	1.2	92
40.0	.4	150	1.5	180	1.8	95
40.0	.4	200	2.0	220	2.2	92
30.0	.3	200	2.0	241	2.4	104

Fluorine was determined in water supplies by this method, using 100 ml. as the analytical sample.

DISCUSSION

Urinary fluorine in specimens from over 1,900 men and boys representing a variety of conditions ranging from flouride-free to high flouride domestic-water areas, has been studied. A remarkable relationship was observed between urinary fluorine and fluorine content of domestic water. Beginning with exposures approximating 0.5 p. p. m. fluorine in the local domestic water, urine specimens show a detectable increase in fluorine. Fluorine in urine continues proportional to water fluorine up to about 5.0 p. p. m. fluorine in the local water supply (fig. 1).

The sensitivity of urinary fluorine excretion to fluorine in the drinking water is shown by data in table 3. The consumption of fluoride waters by one of us (F. J. Mc.) produced an immediate proportional increase in urinary fluorine. During these field studies

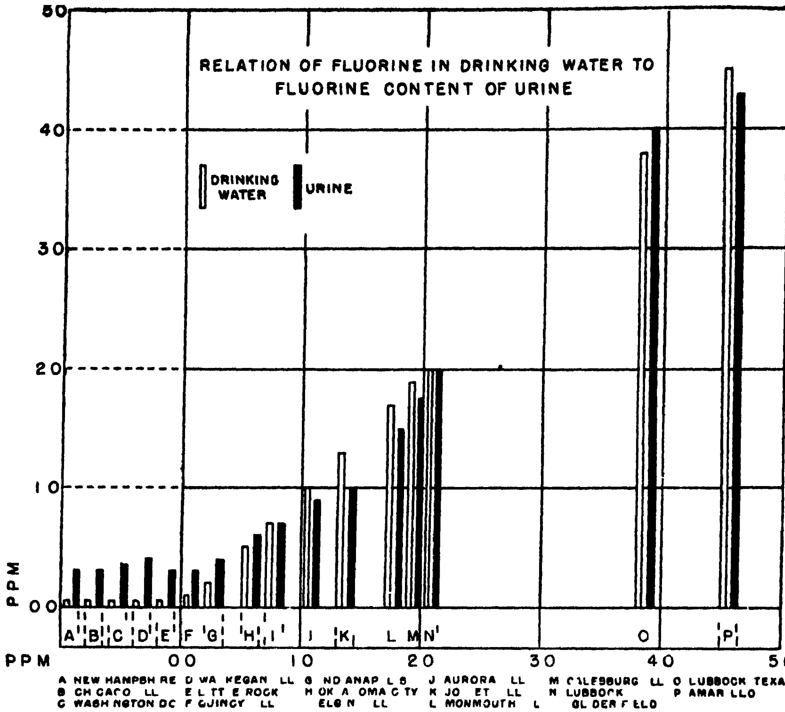


FIGURE 1

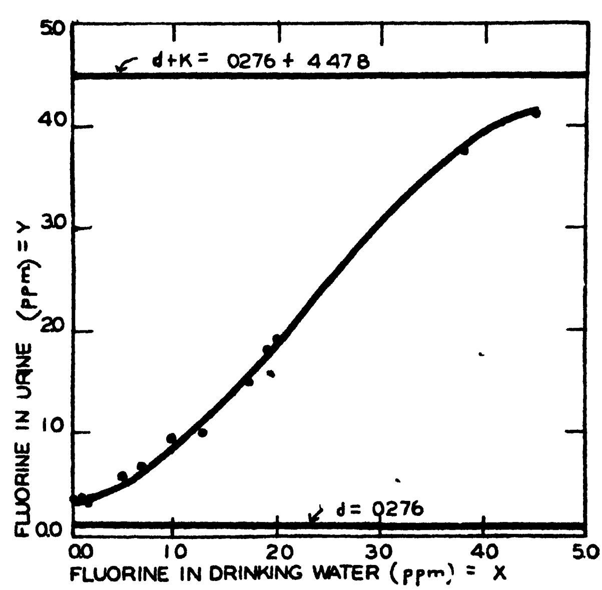
TABLE 3.—*Fluorine content of urine of one individual (F. J. Mc.) Residence in Washington, D. C., versus residence in Lubbock, Tex., and Galesburg, Monmouth, Aurora, Elgin, and Quincy, Ill.*

Location	Date (1943)	Fluorine in drinking water (p. p. m.)	Fluorine in urine (p. p. m.)	Comment
Washington, D. C.	Jan. 12	0 0	0 4	24 hour collection
	Jan. 13	0	2	
	Jan. 14	0	3	
	June 29	0	4	
	June 30	0	3	
	July 1	0	4	
Lubbock, Tex.	July 6	3 8	3 0	First 18 hours in Lubbock
	July 7	3 8	3 9	Second 24 hours in Lubbock
	July 8	3 8	4 0	Third 24 hours in Lubbock
	July 9	3 8	3 5	Fourth 24 hours in Lubbock
	July 11	3 8	3 8	Sixth day in Lubbock, night urine
	July 13	3 8	3 6	Eighth day in Lubbock, night urine
	July 15	3 8	3 6	Tenth day in Lubbock, night urine
	July 17	3 8	3 5	Twelfth day in Lubbock, night urine
Galesburg, Ill.	Oct. 21	1 9	1 8	First day in Galesburg, night urine
	Oct. 22	1 9	1 8	Second day in Galesburg, night urine
	Oct. 23	1 9	1 3	Third day in Galesburg, night urine
	Oct. 24	1 9	2 1	Fourth day in Galesburg, night urine
Quincy, Ill.	Oct. 25	1	5	First day in Quincy, night urine
	Oct. 26	1	4	Second day in Quincy, night urine
	Oct. 27	1	5	Third day in Quincy, night urine
Galesburg, Ill.	Oct. 28	1 9	1 7	First day in Galesburg, night urine
	Oct. 31	1 9	1 1	Fourth day in Galesburg, night urine
Monmouth, Ill.	Nov. 2	1 7	1 0	Second day in Monmouth, night urine
	Nov. 3	1 7	2 1	Third day in Monmouth, night urine
Aurora, Ill.	Nov. 6	1 0	1 1	Third day in Aurora, night urine
Elgin, Ill.	Nov. 10	7	7	Fourth day in Elgin, night urine

TABLE 4.—*Fluorine content of urine. Relation to fluorine in drinking water. Summary of data appearing in tables 1 and 2*

Location	Fluorine in water (p p m)	Fluorine in urine (p p. m)	Number of specimens represented	Comment
Amarillo, Tex	4 7	4 6	26	High-school boys, aged 16 to 18
	4 7	4 0	42	Selectees, Lubbock induction center
Air Field, Lubbock, Tex	5 1	4 0	50	Servicemen stationed at Air Field
Lubbock, Tex	3 8	3 8	62	High-school boys, aged 16 to 18
	5 8	4 2	21	Texas Technical College men, aged 17 to 21
	5 8	3 7	108	Selectees, Lubbock induction center
Glider Field, Lubbock, Tex	2 0	2 0	16	Servicemen stationed at Glider Field
Galesburg, Ill	1 9	1 8	173	High-school boys, aged 15 to 17
Monmouth, Ill	1 7	1 5	87	High-school boys, aged 15 to 17
Joliet, Ill	1 3	1 0	21	Selectees, Chicago induction center
Aurora, Ill	1 0	9	173	High-school boys, aged 15 to 17
Elgin, Ill	7	7	158	High-school boys, aged 15 to 17
Rural central Indiana	[1] 5	7	109	Selectees, Indianapolis, Ind , induction center
Oklahoma City, Okla	5	6	26	High school boys, aged 16 to 18
Indianapolis, Ind	2	4	121	Selectees, Indianapolis induction center
Chicago, Ill	0	3	60	Selectees, Chicago induction center
Quincy, Ill	1	3	85	High school boys, aged 15 to 17.
Washington, D C	0	4	202	Selectees, Fort Myer, Va , induction center
	0	3	67	High school boys, aged 15 to 17
Little Rock, Ark	0	3	26	High school boys, aged 15 to 18
Waukegan, Ill	0	4	112	High school boys aged 15 to 17
New Hampshire	0	3	174	Selectees, Manchester induction center

[1] Estimated average for fluorine in waters in this area



$$Y - d = \frac{K}{1 + Ce^{rx}}, \quad Y = .0276 + \frac{4.478}{1 + 13\,003\,e^{-1.109X}}$$

FIGURE 2—The relationship between fluorine in drinking water and fluorine in urine fitted with a symmetric logistic curve for the interval x=0 0 to x=4 5.

wherever specimens were collected the fluorine concentration of urine specimens of this individual followed closely the fluorine contained in the local drinking water.

As shown in tables 1 and 2, individual urine specimens were pooled to provide an analytical sample for fluorine determination. A total of 114 comparisons between fluoride domestic water and urinary fluorine, covering 13 levels of water-fluorine concentration, is available for study. Inspection of these data suggested that a logistic curve (*20*) would be most suited to describe graphically the water fluorine-urinary fluorine relation. Accordingly, using the equation $Y-d=\frac{K}{1+Ce^{rx}}$ (*20*), the symmetric logistic curve shown in figure 2, was obtained.[2] The data as used and the observed and predicted values for urinary fluorine are as follows:

Number of pooled urine analyses averaged	Fluorine in drinking water (p p m)	Fluorine in urine (found) (p p m)	Fluorine in urine (calculated) (p p m)
35	0 0	0 340	0 348
8	1	375	382
6	2	383	420
1	5	600	557
7	7	671	.660
8	1 0	925	875
1	1 3	1 000	1 127
6	1 7	1 516	1 534
14	1 9	1 814	1 763
2	2 0	1 900	1 883
22	3 8	3 759	3 785
3	4 5	4 166	4 143

Within the range of water-borne fluorine (0.0 to 4.5 p. p. m. F) the logistic curve appears particularly descriptive of these data. Absence of fluorine in water (X equals 0.0) gives values equalling 0.340 p. p. m. (observed) and 0 348 p. p. m. (calculated) for fluorine in urine, and the other observed and calculated values are in very close agreement. Within the range 1.0 p. p. m. to 4.0 p. p. m. fluorine in water the curve rises rapidly and begins to level off at slightly above 4.0 p. p. m. water-fluorine concentration. At higher levels of water fluorine, however, it is unquestioned that the urinary flourine would continue to increase and, with additional data for waters above 4.5 p. p. m. fluorine the calculation of a logistic curve would be expected to give a higher value to the asymptote (*20*).

The association shown between water and urinary fluorine is strikingly similar to the relation between water fluorine and mottled enamel as observed by Dean (*3*). The logistic curve appears to describe adequately both mottled enamel and urine fluorine as related to fluorine in drinking water. It is to be noted, however, that the

[2] One urinary value representing but one pooled urine sample, i e, for 5 1 p p m. fluorine in water, was rejected in the calculation of this logistic curve.

logistic curve which would appear to describe Dean's data showing the relation between fluorine in drinking water and index of dental fluorosis (fig. 2 in Dean's article (3)) applies to values of X (water fluorine) ranging from 0.0 to 14 p. p. m. There is every indication in Dean's data also that the maximum mottled enamel effect (index of dental fluorosis) is reached at about 6 p. p. m. water fluorine. The logistic curve for urinary fluorine concentration (fig. 2), on the other hand, applies only to a range of 0.0 to 4.5 p. p. m. fluorine in drinking water and is not intended to describe urinary-fluorine concentrations beyond 4.5 p. p. m. of water fluorine.

Without quantitative ingestion and excretion data it is obviously impossible to assess exactly the relations between total fluorine ingested from drinking water and food and the accompanying total fluorine elimination in urine, feces, and perhaps sweat. At the same time, in view of the large number of urine specimens represented and the wide variety of conditions surrounding the eating and drinking habits of these individuals, important deductions regarding the ingestion and metabolism of fluorine from food and drinking water seem justified.

First, it may be pointed out that the pronounced increases of fluorine in urine which accompany these exposures to fluorine in drinking water provide additional evidence that fluoride domestic waters are to be regarded as the most important as well as the most universal source of fluorine in human diets. The close correlation between urinary fluorine and domestic-water fluorine lends strong support to this conclusion. It is of interest to note also the uniformity in the urinary-fluorine figures for areas as widely separated as New Hampshire, Washington, D. C., Waukegan and Chicago, Ill., Quincy, Ill., Indianapolis, Ind., and Little Rock, Ark. (tables 1 and 2). A very uniform quantity of fluorine appears to be absorbed daily from foods as ingested by individuals residing in these several nonfluoride localities. These data suggest that the content of fluorine in the average human diet, exclusive of drinking water is remarkably uniform regardless of the locality. It may be suggested that this is indicative also that fluorine in food produce is quite uniform, regardless of the conditions under which the food is grown or produced.

The urinary fluorine data also seem to be in accord with previous estimates of total fluorine in the average diet exclusive of drinking water. Although analytical fluorine data on foods still lack the accuracy desirable for final conclusions, 0.2 to 0.5 p. p. m. or less fluorine seems to be a reasonably good estimate to apply to most fresh foods (*18*). Teas and seafoods in general contain unusual quantities of fluorine (teas 40 to 60 p. p. m., seafoods 2 to 12 p. p. m.), but it does not appear that these foods contribute significantly to the average daily fluorine ingested from food alone. The average daily

diet has been estimated to contain 0.3 to 0.5 mg. fluorine (*18*). Numerous analyses of the daily diet of an adult man showed on the average 0.45 mg. fluorine present daily, exclusive of water drinking per se (*11*). This individual was residing in Cincinnati, Ohio, a nonfluoride area. As of November 1939, the Cincinnati water supply contained less than 0.2 p. p. m. fluorine (*19*). Another estimate, based on analyses of meals served to the staff of the Minnesota General Hospital, Minneapolis, Minn., indicates a daily intake of 0.27 to 0.32 mg. fluorine "from sources other than water" (*21*).

Urinary fluorine in concentrations equalling 0.3 to 0.5 p. p. m. (tables 1, 2, and 3) will account for approximately 0.3 to 0.5 mg. fluorine eliminated daily in the urine alone, assuming 1,000 ml. as an average daily volume of urine. In support of this estimate it may be noted that the Brun, Buchwald, and Roholm (*13*) found 0.92 mg. to be the average quantity of fluorine in 24-hour urine specimens of 30 hospital patients aged 2 months to 70 years. The analytical figures for these daily specimens averaged 0.80 p. p. m. fluorine.[2] It may be suggested, therefore, that 0.3 to 0.5 mg. fluorine appears to be a reasonably good estimate of total daily fluorine eliminated in the average 24-hour urinary excretion, as applied to individuals 15 to 17 years old or older residing in nonfluoride areas.

Fluorine balance studies reported by Machle, Scott, and Largent (*11*) are of interest in these regards as showing that fluorine in food equalling about 0.3 to 0.6 mg. fluorine ingested daily, is largely eliminated from the body. Approximately 88 percent of the total fluorine ingested appeared in the urine, about 8 percent being excreted in the feces. These data (*11*) also are cited by these workers as emphasizing the significance of the urinary fluorine figure as an approximate index of the level of ingestion and elimination of fluorine as applied to the average adult.

The importance of water-borne fluorine as a source of fluorine in average diets has been strongly implied in previous epidemiological studies relative to water-borne endemic dental fluorosis (*3*), as well as in epidemiological studies showing the striking relation of fluorine in drinking water to dental caries (*4*, *5*). As noted above, Dean (*4*) has failed to find the "fluoride intake from sources other than domestic water" sufficient "to produce even the faintest signs of dental fluorosis in as little as one percent" of a group of 2,042 white public school children using fluoride-free Lake Michigan water (*4*). The epidemiological surveys relative to water fluoride-dental caries relations, demonstrate a remarkable relation between fluorine in

[2] During the preparation of this manuscript, E. J. Largent and I. F. Ferneau (J. Indust. Hyg. and Toxicol., 26: 113 (April 1944)) presented evidence that spot urine specimens will give analytical fluorine figures almost identical with the fluorine analysis for the corresponding total 24-hour urine excretion.

domestic water and dental caries experience in 12- to 14-year age groups exposed to these waters throughout life. This relation is maintained regardless of possible differences in local food conditions and thus appears to be an effect of water-borne fluorine alone, over and above food fluorine. In all these epidemiological dental studies the evidence has been indicative (and now seems supported by urinary-fluorine data) that the predominant source of additional fluorine associated with dental effects of fluorine is the domestic water supply. There is little or no acceptable evidence that food produced in fluoride areas contains increased quantities of fluorine. It seems worth emphasizing that fluorine provided by sources other than drinking water in the average diet is a quite uniform quantity approximating 0.3 to 0.5 mg. daily. This much fluorine in the daily diet seems secondary in importance, both as to quantity and physiological effects, in comparison with the fluorine provided by fluoride domestic water supplies indigenous to the United States and other parts of the world. Insofar as the most significant source is the drinking water, fluorine appears to be a unique dietary constituent.

A second important implication surrounding the urinary fluorine figures relates to the daily accumulation of fluorine in skeletal tissue which might accompany exposure to fluorine in drinking water. It is strongly implied by these urinary fluorine data that fluorine present in drinking water in concentrations up to at least 4.0 to 5.0 p. p. m., when ingested by men and boys of these age groups, is largely eliminated in the urine. There is no reason to anticipate a sex difference in these regards, so it may be presumed that an efficient elimination of fluorine is characteristic of individuals in this age group, regardless of sex, exposed to these concentrations of fluorine in drinking water. It is not to be inferred, however, that these data indicate that storage of fluorine does not occur to any extent from these low concentrations of water-borne fluorine. This conclusion, as noted above, can be justified only by controlled balance experiments.

The hazard of cumulative fluorosis from water-borne fluorine in these concentrations may be minimized also by the following observations: (a) Fluorine is not an essential element but in small quantities appears to be a harmless constituent of all skeletal tissue. Trace quantities of fluorine in foods are a source of this fluorine. (b) According to experimental evidence fluorine may accumulate in skeletal tissue to an appreciable extent without injury. A tenfold increase in fluorine content of bones of experimental animals above an assumed normal of about 200 p. p. m. has been suggested by Peirce (*22*) as commensurate with absence of manifest morphological change in skeletal tissue. This is a highly tentative figure and may be too high. The tolerance of human skeletal tissue in terms of

fluorine storage cannot be exactly stated at this time. (c) Results reported by Lawrenz, Mitchell, and Ruth (*23*) indicate that "growing rats adapt themselves to the continuous ingestion of low levels of fluorine by excreting greater and greater proportions of the ingested fluorine in feces and urine. This adaptation involves the excretory capacity of both kidney and intestine, that of the latter to a somewhat greater extent" (*23*). Fluorine in diets fed these rats ranged from 4 to 12.5 p. p. m. There is other evidence indicating that when increasing quantities of fluorine were ingested by a dog (*24*) and growing rats (*25*) a much larger percent of the quantity ingested was eliminated from the body. Other experiments by Lawrenz, Mitchell, and Ruth (*26*) also suggest an increased efficiency in fluorine elimination in rats, as associated with lengthening periods of fluorine feeding. (d) Mobilization of fluorine from skeletal tissue (*13*) seems to be a normal and perhaps a very important phase of fluorine metabolism. This defense mechanism has an analogy in the mobilization of lead from skeletal tissue. It may be a highly significant action connected with the defense of the organism against skeletal storage of toxic quantities of fluorine.

Excessive fluorine ingestion, however, under any circumstance, increases the fluorine stores of the body, and the tolerance level of fluorine per se in the skeletal tissue may be exceeded. Toxic bone fluorosis and accompanying morphologic effects will probably appear. However, systemic evidence of fluorine toxicosis related to skeletal storage of fluorine has not been reported as associated with the domestic use of fluoride waters most common in the United States. This subject has had very little study in fluoride areas of this country. It would appear, however, in the light of the urinary fluorine data available, that cumulative storage of fluorine as related to these low concentrations of fluorine in domestic waters is not sufficient to cause serious concern. As related to these low fluoride domestic waters, this form of fluorine toxicosis seems unlikely to become an endemic health problem.

Finally, it may be noted that fluorine in urines where 0.0 to 0.2 p. p. m. fluorine occurred in the drinking water averages 0.3 to 0.5 p. p. m. fluorine according to our data. This is considerably less fluorine than Machle's reported mean of 1.07 ± 0.02 p. p. m. fluorine in urines of 101 subjects selected at random (*9*). Although the residences of these individuals as reported by Machle (*9*), do not indicate an exposure to fluorine from local water supplies, there is no assurance of this fact. For comparison with our data it may be recalled also that Brun, Buchwald, and Roholm (*13*) found an average of 0.80 p. p. m. fluorine in 24-hour urine specimens of 30 hospital patients. The fluorine exposures of these patients also are not stated.

SUMMARY

The fluorine content of urine specimens of a large number of men and boys has been studied in relation to fluorine in their domestic water supplies. Where domestic waters are free of fluorine, the fluorine present in urine averages 0.3 to 0.5 p. p. m. An increase of fluorine in urine was associated with the use of domestic waters containing as little as 0.5 p. p. m. fluorine. Fluorine in urine specimens continues strikingly proportional to the fluorine content of the drinking water through the range of 0.5 to 5.1 p. p. m. fluorine in the domestic water. The results appear to furnish additional evidence of the importance of water-borne fluorine as a source of fluorine in human diets. The data agree with previous epidemiological studies which have demonstrated a striking relation between fluorine in communal water supplies and dental health, including reduced incidence of dental caries in 12- to 14-year-old children.

The close correlation between fluorine in drinking water and fluorine content of urine suggests that the presumed hazard of cumulative toxic bone-fluorosis surrounding certain water-borne sources of fluorine in the United States is greatly reduced by this relationship. An efficient urinary elimination of fluorine appears to be characteristic of individuals residing in certain fluoride areas of the United States, where the drinking water contains 0.5 to 5.0 p. p. m. fluorine. The metabolism of fluorine under these conditions seems to be a normal function of the human body and seems characterized by a condition approaching metabolic equilibrium, at least in the adult organism.

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PERMISSION FOR PUBLICATION

Permission for publication of the data obtained at armed forces induction centers and from the Lubbock Air and Glider Fields has

been granted by the Office of the Surgeon General, War Department, Washington, D C

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INCIDENCE OF HOSPITALIZATION, OCTOBER 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country mostly in large cities.

Item	October	
	1943	
1. Number of plans supplying data	65	76
2. Number of persons eligible for hospital care	10,473,984	15,384,804
3. Number of persons admitted for hospital care	89,070	132,891
4. Incidence per 1,000 persons, annual rate, during current month (daily rate×365)	100.1	102.0
5. Incidence per 1,000 persons, annual rate for the 12 months ending October 31	105.0	103.8

DEATHS DURING WEEK ENDED NOVEMBER 11, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 11, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	8,607	8,621
Average for 3 prior years	8,568	
Total deaths, first 45 weeks of year	403,799	411,025
Deaths under 1 year of age	582	627
Average for 3 prior years	604	
Deaths under 1 year of age, first 45 weeks of year	27,922	29,715
Data from industrial insurance companies		
Policies in force	66,882,764	66,035,045
Number of death claims	11,875	12,330
Death claims per 1,000 policies in force, annual rate	9.3	9.7
Death claims per 1,000 policies, first 45 weeks of year, annual rate	10.0	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 18, 1944

Summary

A total of 288 cases of poliomyelitis was reported, as compared with 314 last week, 221 for the corresponding week last year, and a 5-year (1939–43) median of 174. Of the current total, 181 cases occurred in the 7 States reporting 10 or more cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 13 (9), Ohio 24 (19), North Carolina 10 (4), California 14 (4); *decreases*—New York 93 (106), Pennsylvania 15 (27); *no change*—Illinois 12 (12). The cumulative total to date is 18,490, as compared with a 5-year median of 8,535 and 11,843 for the corresponding period last year. The latter figure is 95 percent of the total for that year.

The incidence of meningococcus meningitis for the current week, 204 cases, is 33 percent higher than last week's total of 153. The corresponding 5-year median is 30. Increases occurred in the New England, Middle Atlantic, West Central, and Pacific areas. States reporting the largest numbers are New York (27), California (19), Pennsylvania (18), Ohio (14), Michigan (13), and New Jersey and Texas (12 each).

Current figures above the corresponding 5-year medians were reported for diphtheria, influenza, and scarlet fever.

A total of 3,243 cases of scarlet fever was reported, as compared with 2,845 last week, 3,053 for the corresponding week last year, and a 5-year median of 2,651. The cumulative figure since the lowest weekly incidence of the year, 647 cases for the week ended August 26, is 20,839, as compared with 23,500 for the corresponding period last year and a 5-year median of 20,800.

A total of 9,143 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,607 last week and a 3-year (1941–43) average of 8,930. The cumulative figure to date is 412,943, as compared with 420,065 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 18, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Nov 18 1944	Nov 20 1943		Nov 18 1944	Nov 20 1943		Nov 18 1944	Nov 20 1943		Nov 18, 1944	Nov 20 1943	
NEW ENGLAND												
Maine	1	0	1				0	112	92	0	3	1
New Hampshire	0	0	0				20	0	4	2	0	0
Vermont	0	0	0				2	2	9	0	0	0
Massachusetts	2	14	5				83	224	224	7	16	4
Rhode Island	2	1	1	14			2	62	6	0	2	0
Connecticut	0	3	0		3	1	13	3	32	7	4	0
MIDDLE ATLANTIC												
New York	13	13	13	[1] 1	[1] 5	[1] 11	44	281	207	27	33	3
New Jersey	4	0	7	5	16	10	13	282	20	12	6	1
Pennsylvania	10	8	14	1	3		33	222	222	18	23	4
EAST NORTH CENTRAL												
Ohio	14	16	16	8	3	10	11	259	27	14	13	1
Indiana	10	20	20	3	9	9	3	111	22	1	5	0
Illinois	3	8	26	4	4	8	24	64	34	10	9	4
Michigan [2]	17	6	6		2	2	8	281	160	13	21	3
Wisconsin	4	4	2	12	18	28	9	329	116	2	4	0
WEST NORTH CENTRAL												
Minnesota	11	9	3		1		6	725	28	2	7	0
Iowa	9	2	4			1	3	96	28	0	2	0
Missouri	12	1	12	1	3	1	0	4	8	9	8	1
North Dakota	7	1	1			2	0	226	4	1	1	0
South Dakota	1	4	1		1	1	10	4	4	1	0	0
Nebraska	1	5	2	18	3		14	5	2	2	0	0
Kansas	4	10	6		9	4	7	9	22	3	0	0
SOUTH ATLANTIC												
Delaware	0	0	0				1	6	0	1	3	0
Maryland [2]	8	6	7	4	2	4	3	21	21	3	7	0
District of Columbia	0	1	1	3			2	9	1	1	5	0
Virginia	12	12	29	205	168	157	8	62	55	3	10	2
West Virginia	1	8	9	17		13	11	50	24	1	2	0
North Carolina	34	27	49	2	1	5	7	68	68	1	9	1
South Carolina	8	8	24	302	295	306	1	6	5	1	1	0
Georgia	27	14	20	18	34	35	1	24	9	3	4	0
Florida	20	20	11		7	3	9	24	5	2	5	0
EAST SOUTH CENTRAL												
Kentucky	7	8	11	1	1	7	3	11	11	4	9	1
Tennessee	8	15	15	5	25	28	14	15	15	7	7	0
Alabama	34	25	25	29	60	60	0	67	8	3	3	2
Mississippi [2]	27	11	18							0	2	1
WEST SOUTH CENTRAL												
Arkansas	18	8	12	28	45	53	6	28	8	3	0	0
Louisiana	13	13	10	3	15	10	2	20	1	1	3	1
Oklahoma	22	2	17	43	39	39	1	13	5	1	0	0
Texas	80	43	46	993	716	553	16	63	41	12	2	0
MOUNTAIN												
Montana	1	5	3	12	5	1	3	85	9	0	0	0
Idaho	0	2	1	3			0	1	1	0	0	0
Wyoming	0	0	1	1	1	1	1	3	3	0	0	0
Colorado	4	11	11	11	30	30	6	46	46	1	0	0
New Mexico	3	0	1		19	1	1	0	8	0	1	0
Arizona	5	7	6	55	103	84	1	3	8	0	0	0
Utah [2]	0	0	0	22	6	6	4	3	23	1	4	0
Nevada	0	0	0				1	0	0	0	0	0
PACIFIC												
Washington	19	8	1				30	49	49	2	3	1
Oregon	9	2	2	11	3	12	16	23	23	3	4	0
California	30	30	22	28	19	46	157	64	64	19	24	3
Total	512	408	502	1,863	1,734	1,734	610	4,065	2,483	204	265	30
46 weeks	11,706	11,921	13,575	352,351	95,943	160,713	597,762	561,941	480,638	14,985	16,061	1,798

[1] New York City only

[2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended November 18, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Nov. 18, 1944	Nov. 20, 1943		Nov. 18, 1944	Nov. 20, 1943		Nov. 18, 1944	Nov. 20, 1943		Nov. 18, 1944	Nov. 20, 1943	
NEW ENGLAND												
Maine	1	0	0	56	18	9	0	0	0	0	0	0
New Hampshire	0	2	0	25	10	9	0	0	0	2	0	0
Vermont	0	0	0	6	1	2	0	0	0	0	0	0
Massachusetts	13	4	1	175	187	156	0	0	0	1	5	1
Rhode Island	0	1	0	9	6	6	0	0	0	2	0	0
Connecticut	7	6	0	31	39	35	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	93	12	12	237	290	236	0	0	0	6	7	7
New Jersey	7	0	3	50	98	88	0	0	0	1	4	3
Pennsylvania	15	3	8	203	179	179	0	0	0	3	6	9
EAST NORTH CENTRAL												
Ohio	24	4	7	324	288	210	0	0	0	2	2	8
Indiana	4	0	1	77	90	86	2	7	1	3	0	1
Illinois	12	24	12	180	115	168	1	0	0	6	0	2
Michigan [2]	9	4	5	147	129	156	0	0	0	1	3	2
Wisconsin	5	3	4	94	143	117	2	1	1	1	0	0
WEST NORTH CENTRAL												
Minnesota	7	1	3	63	56	56	0	0	1	0	0	0
Iowa	1	3	3	41	78	52	0	0	1	2	4	2
Missouri	6	1	1	65	49	62	2	0	0	0	0	1
North Dakota	1	0	0	11	9	11	0	0	0	0	0	0
South Dakota	0	0	0	6	12	13	0	0	0	0	0	0
Nebraska	4	0	2	44	17	17	1	1	0	0	1	1
Kansas	1	11	2	84	74	83	1	0	0	0	0	2
SOUTH ATLANTIC												
Delaware	5	0	0	3	7	9	0	0	0	0	1	0
Maryland [2]	4	2	2	99	32	32	0	0	0	3	1	3
District of Columbia	1	0	0	17	11	11	0	0	0	0	0	0
Virginia	7	0	0	104	44	79	0	0	0	1	2	8
West Virginia	6	0	1	116	79	67	0	0	0	2	0	3
North Carolina	10	0	2	83	123	89	0	0	0	2	2	2
South Carolina	2	1	1	10	12	21	1	0	0	1	1	2
Georgia	3	1	1	40	29	43	0	0	0	2	0	8
Florida	0	0	1	7	10	9	0	0	0	2	4	3
EAST SOUTH CENTRAL												
Kentucky	4	1	3	62	43	34	0	1	0	6	1	5
Tennessee	0	1	2	88	47	71	0	0	0	5	2	4
Alabama	1	2	2	35	15	42	0	0	0	0	1	2
Mississippi [2]	0	0	2	20	14	15	0	0	0	0	2	3
WEST SOUTH CENTRAL												
Arkansas	1	0	0	30	12	13	0	0	0	8	4	4
Louisiana	0	3	1	16	10	10	0	0	0	2	8	8
Oklahoma	1	5	1	24	73	23	0	0	0	1	6	3
Texas	8	12	6	97	55	55	0	3	0	15	14	9
MOUNTAIN												
Montana	1	0	0	18	19	19	0	0	0	1	1	1
Idaho	0	0	1	19	30	7	0	0	0	0	1	1
Wyoming	0	3	1	11	5	5	0	0	0	0	0	0
Colorado	2	0	0	57	37	36	0	0	0	1	1	2
New Mexico	0	4	0	14	8	8	0	0	0	0	2	2
Arizona	0	0	0	11	26	6	0	0	0	2	1	1
Utah [2]	0	6	2	15	36	19	0	0	0	0	3	1
Nevada	0	0	0	1	2	0	0	0	0	0	1	0
PACIFIC												
Washington	4	30	3	51	91	30	0	0	0	4	1	1
Oregon	4	17	4	34	53	16	0	0	0	2	0	0
California	14	54	23	233	242	146	0	0	0	1	2	4
Total	288	221	174	3,243	3,053	2,651	10	13	13	92	95	136
46 weeks	18,490	11,843	8,535	169,078	121,996	121,996	354	676	1,265 [4]	5,047	5,085	7,830

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: New Hampshire 2; New York 1, Illinois 1; Maryland 1; Georgia 1, Texas 5.
[4] Cumulative total changed by corrected reports.

Telegraphic morbidity reports from State health officers for the week ended November 18, 1944, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Whooping cough: Week ended— Nov. 18, 1944	Whooping cough: Week ended— Nov. 20, 1943	Whooping cough: Median 1939–43	Week ended Nov. 18, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	55	17	36	0	0	0	0	0	0	0	0	0
New Hampshire	23	0	1	0	0	2	0	0	0	0	0	0
Vermont	53	7	9	0	0	0	0	0	0	0	0	0
Massachusetts	122	113	158	0	0	2	0	1	0	0	0	0
Rhode Island	23	29	12	0	0	0	0	0	0	0	0	0
Connecticut	91	31	72	0	0	2	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	310	294	465	0	2	74	0	1	0	0	0	0
New Jersey	103	135	186	0	5	1	0	0	0	0	0	1
Pennsylvania	137	164	305	0	0	1	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	79	142	186	0	1	0	0	0	0	0	1	0
Indiana	16	55	39	0	0	0	1	0	0	0	1	0
Illinois	58	160	198	0	1	10	0	2	0	0	3	0
Michigan [2]	59	157	263	0	0	5	0	0	0	0	0	0
Wisconsin	59	153	188	0	5	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	39	38	52	0	5	0	0	0	0	0	0	0
Iowa	4	61	17	0	0	0	0	0	0	0	0	0
Missouri	40	26	26	0	0	0	0	0	0	0	0	0
North Dakota	10	5	13	0	0	0	0	0	0	0	0	0
South Dakota	3	10	5	0	0	0	0	0	0	0	0	0
Nebraska	1	15	7	0	0	0	0	0	0	0	0	0
Kansas	38	31	49	0	0	1	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	1	9	0	0	0	0	0	0	0	0	0
Maryland [2]	101	74	74	0	0	0	0	0	0	0	0	0
District of Columbia	7	7	11	0	0	0	0	0	0	0	0	0
Virginia	16	59	59	0	0	0	2	0	0	0	2	0
West Virginia	24	22	22	0	0	0	0	0	0	0	0	0
North Carolina	69	193	107	0	0	0	0	0	0	0	0	9
South Carolina	67	53	32	0	1	7	0	0	0	0	0	6
Georgia	3	10	14	0	0	0	0	0	0	0	0	43
Florida	7	7	7	0	0	1	0	1	1	0	0	12
EAST SOUTH CENTRAL												
Kentucky	5	88	68	0	0	0	0	0	0	0	2	0
Tennessee	12	23	43	0	4	0	3	1	0	0	2	3
Alabama	28	26	13	0	20	0	0	0	0	1	0	12
Mississippi [2]	------	------	------	0	0	0	0	0	0	0	0	6
WEST SOUTH CENTRAL												
Arkansas	30	49	11	0	0	13	0	0	0	0	0	0
Louisiana	0	2	2	0	3	0	0	0	1	0	0	1
Oklahoma	8	0	10	0	0	4	0	0	0	0	0	0
Texas	167	93	89	0	7	504	59	2	0	0	0	44
MOUNTAIN												
Montana	26	9	9	0	0	0	0	0	0	0	0	0
Idaho	0	4	5	0	0	0	0	0	0	0	0	0
Wyoming	17	3	2	0	0	0	0	0	0	0	0	0
Colorado	24	53	38	0	0	0	0	0	0	0	0	0
New Mexico	0	2	20	0	0	1	3	1	0	0	0	0
Arizona	39	36	5	0	0	0	11	2	0	0	0	0
Utah [2]	12	21	25	0	0	0	0	0	0	0	0	0
Nevada	0	13	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	23	73	57	0	0	0	0	0	0	0	0	0
Oregon	2	17	22	0	0	0	0	0	0	0	0	0
California	122	104	164	0	2	14	0	1	0	0	0	4
Total	2,132	2,675	3,296	0	56	642	298	12	2	1	11	141
Same week, 1943	2,675	------	------	1	41	648	81	13	2	2	6	110
Same week, 1942	3,600	------	------	1	25	168	37	10	1	0	12	91
46 weeks, 1944	84,921	------	------	38	1,668	21,685	8,167	589	29	451	500	4,669
46 weeks, 1943	164,249	------	------	61	1,897	15,276	6,991	623	27	430	714	3,930
46 weeks, 1942	159,129	------	[5] 159,129	72	1,090	11,365	6,138	522	43	[5] 450	770	[5] 2,603

[2] Period ended earlier than Saturday.

[5] 5-year median, 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 11, 1944

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	1	8	0	0	1
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	0	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	4
Massachusetts:												
Boston	0	0	------	1	93	1	14	8	51	0	0	13
Fall River	0	0	------	0	0	0	2	0	4	0	0	7
Springfield	0	0	------	0	2	1	1	0	4	0	0	4
Worcester	0	0	------	0	2	0	10	0	5	0	0	13
Rhode Island:												
Providence	0	0	------	0	0	1	2	0	9	0	0	0
Connecticut:												
Bridgeport	0	1	------	0	0	0	1	0	2	0	0	0
Hartford	0	0	------	0	3	1	1	0	0	0	0	5
New Haven	0	0	------	0	1	1	0	0	6	0	0	9
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	0	0	4	3	5	0	0	0
New York	8	1	2	0	5	18	64	45	97	0	3	96
Rochester	0	0	------	0	12	2	5	4	4	0	0	8
Syracuse	0	0	------	0	0	0	2	0	5	0	0	5
New Jersey:												
Camden	0	0	------	0	0	1	0	0	0	0	0	1
Newark	0	0	2	0	1	0	2	1	1	0	0	2
Trenton	1	0	------	0	0	1	0	1	0	0	0	0
Pennsylvania:												
Philadelphia	0	0	1	0	0	3	15	3	41	0	1	29
Pittsburgh	1	0	3	2	0	5	7	0	10	0	2	4
Reading	0	0	------	0	0	0	0	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	4	0	------	1	0	4	6	7	13	0	0	2
Cleveland	1	0	2	2	3	2	11	4	24	0	1	24
Columbus	0	0	2	2	1	0	1	0	7	0	0	1
Indiana:												
Fort Wayne	0	0	------	0	0	0	2	0	1	0	0	0
Indianapolis	0	0	------	1	2	1	6	0	7	0	0	8
South Bend	1	0	------	0	1	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	1	0	0	0	0	0	1
Illinois:												
Chicago	1	0	4	2	10	6	23	7	56	0	0	36
Springfield	0	0	------	0	0	0	2	0	1	0	0	1
Michigan:												
Detroit	6	0	------	0	1	10	9	4	44	0	0	3
Flint	0	0	------	0	0	0	3	0	2	0	0	2
Grand Rapids	0	0	------	0	0	0	0	0	5	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	2	0	0	13
Milwaukee	0	0	1	1	0	1	2	0	6	0	0	5
Racine	0	0	------	0	1	0	0	0	1	0	0	6
Superior	0	0	------	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	0	1	1	1	3	0	0	4
Minneapolis	6	0	------	0	0	1	3	5	8	0	0	2
St. Paul	0	0	------	1	1	0	3	1	9	0	0	16
Missouri:												
Kansas City	1	0	------	0	0	0	6	0	14	0	0	8
St. Joseph	0	0	------	0	0	0	0	0	1	0	0	0
St. Louis	0	0	1	0	0	1	12	3	6	0	1	8
North Dakota:												
Fargo	0	0	0	0	0	0	0	0	3	0	0	0

City reports for week ended November 11, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Nebraska												
Omaha	0	0		0	6	0	5	0	10	0	0	0
Kansas												
Topeka	0	0		0	2	0	0	0	7	0	0	3
Wichita	0	0		0	0	0	4	0	7	0	0	2
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0		0	1	1	2	0	1	0	0	0
Maryland												
Baltimore	6	0	3	2	2	3	9	2	45	0	0	40
Cumberland	0	0		0	0	0	1	0	2	0	0	0
Frederick	0	0		0	0	0	2	0	0	0	0	0
District of Columbia												
Washington	0	0	1	2	1	2	9	0	14	0	0	1
Virginia												
Lynchburg	0	0		0	0	0	1	1	2	0	0	0
Richmond	2	0		0	0	0	3	1	14	0	1	2
Roanoke	0	0		0	0	0	0	1	2	0	0	0
West Virginia												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	2	0	0	0	8	0	0	0
North Carolina												
Raleigh	0	0		0	0	0	0	0	0	0	0	5
Wilmington	1	0		0	1	0	0	0	3	0	0	0
Winston Salem	0	0		0	0	0	2	1	2	0	0	1
South Carolina												
Charleston	0	0	1	0	0	0	2	0	2	0	0	0
Georgia												
Atlanta	3	0	8	0	0	0	3	0	2	0	0	0
Brunswick	0	0		0	0	0	[illegible]	0	0	0	0	0
Savannah	0	0		0	0	0	[illegible]	0	1	0	0	0
Florida												
Tampa	0	0		0	0	1	3	0	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	2	0	1	0	1	0	11	0	6	0	0	18
Nashville	0	0		1	0	0	4	0	4	0	0	0
Alabama												
Birmingham	3	0	0	0	0	0	3	0	4	0	0	0
Mobile	2	0		1	0	1	4	1	2	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0		0	0	0	0	0	2	0	0	4
Louisiana												
New Orleans	5	0	7	2	0	0	12	0	11	0	0	0
Shreveport	3	0		0	0	0	5	0	1	0	0	0
Texas												
Dallas	3	0		0	0	0	2	0	2	0	0	2
Galveston	0	0		0	0	1	3	0	2	0	0	0
Houston	5	0		0	1	1	6	1	1	0	0	0
San Antonio	1	0		0	0	0	8	0	1	0	0	2
MOUNTAIN												
Montana												
Billings	0	0		0	0	0	1	0	0	0	0	0
Great Falls	0	0		0	0	0	1	0	1	0	0	0
Helena	0	0		0	0	0	1	0	0	0	0	0
Missoula	0	0		0	1	0	2	1	0	0	0	2
Idaho												
Boise	0	0		0	0	0	0	0	5	0	0	0
Colorado												
Denver	2	0	5	0	0	0	8	0	14	0	0	6
Pueblo	0	0		0	0	0	0	0	3	0	0	0
Utah												
Salt Lake City	0	0		0	2	0	1	0	1	0	0	5

City reports for week ended November 11, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington												
Seattle	3	0		2	5	0	2	0	6	0	0	1
Spokane	0	0		0	2	0	1	0	3	0	0	0
Tacoma	0	0	0	0	3	0	0	0	1	0	0	1
California												
Los Angeles	8	0	5	1	0	2	9	0	27	0	0	7
Sacramento	0	0		0	0	1	6	0	6	0	0	3
San Francisco	1	0	3	1	7	2	6	0	33	0	0	9
Total	81	2	52	26	176	78	364	107	727	0	9	459
Corresponding week 1943	95		68	26	879		325		734	1	10	727
Average, 1939–43	97		86	[1] 25	[2] 571		3[illegible]1		679	1	23	967

[1] 3 year average, 1941–43.
[2] 5 year median 1939–43.

Dysentery, amebic.—Cases: New York 2, Chicago 4, Detroit 1.
Dysentery, bacillary.—Cases: Worcester 1, New Haven 1, Buffalo 1, New York 56, Rochester 4, Syracuse 4, Cleveland 1, Chicago 1, Detroit 3, St. Louis 1, Wichita 1, Charleston, S. C. 10, Los Angeles 8.
Dysentery, unspecified.—Cases: Richmond 1.
Leprosy.—Cases: Los Angeles 1.
Tularemia.—Cases: Cincinnati 1, Missoula 1.
Typhus fever.—Cases: New York 1, Wilmington, N. C. 1, Charleston, S. C. 1, Atlanta 9, Savannah 2, Tampa 3, Birmingham 4, Mobile 1, New Orleans 4, Dallas 3, Galveston 2, Houston 9, San Antonio 3, Los Angeles 1.

Rates (annual basis), per 100,000 population, by geographic groups, for the 90 cities in the preceding table (estimated population, 1943, 34,394,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	0.0	2.6		2.6	264	13.1	83.6	23.5	233	0.0	0.0	146
Middle Atlantic	4.6	0.5	3.7	1.4	8	13.5	45.8	26.4	76	0.0	2.8	69
East North Central	7.9	0.0	5.5	5.5	12	15.2	39.5	13.4	103	0.0	0.6	63
West North Central	15.9	0.0	2.0	2.0	18	6.0	47.6	19.9	135	0.0	2.0	86
South Atlantic	19.6	0.0	21.2	4.5	11	11.4	42.1	9.8	163	0.0	1.6	80
East South Central	41.3	0.0	5.9	11.8	6	5.9	129.8	5.9	94	0.0	0.0	106
West South Central	48.8	0.0	20.1	3.7	3	5.7	103.3	2.9	57	0.0	0.0	23
Mountain	15.9	0.0	39.7	0.0	24	0.0	111.2	7.9	191	0.0	0.0	103
Pacific	19.0	0.0	12.7	6.3	27	7.9	38.0	0.0	120	0.0	0.0	33
Total	12.3	0.3	7.9	4.0	27	11.9	55.3	16.3	111	0.0	1.4	70

PLAGUE INFECTION IN TACOMA, WASH.

Plague infection has been reported proved in 2 specimens collected at the waterfront, Tacoma, Wash., one a pool of 2 fleas from 2 rats, *R. rattus*, taken Nov. 1, and the other a pool of 119 fleas from 65 rats, *R. norvegicus*, taken November 4.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended November 4, 1944—During the 4 weeks ended November 4, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows.

Disease	Cases	Disease	Cases
Bilharziasis	12	Poliomyelitis	2
Chickenpox	11	Syphilis	439
Diphtheria	45	Tetanus	12
Dysentery, unspecified	1	Tetanus, infantile	1
Filariasis	2	Tracoma	3
Gonorrhea	441	Tuberculosis (all forms)	534
Influenza	171	Typhoid fever	27
Malaria	957	Typhus fever (endemic)	7
Measles	480	Whooping cough	202
Mumps	3		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 28, 1944.—During the week ended October 28, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		33		116	260	19	23	37	64	552
Diphtheria	1	4	1	60	5	5	4	3		83
Dysentery, bacillary				4		1			7	12
German measles				7	8	3	2	3	6	29
Influenza		7	1		8				2	18
Measles		1	3	211	68	13	12	2	47	357
Meningitis, meningococcus				2	3	1		1	1	8
Mumps			1	103	72	1	1	15	27	220
Poliomyelitis				2	[1] 20	1		3		[1] 26
Scarlet fever		12	7	111	138	15	1	41	27	352
Tuberculosis (all forms)			12	107	55	22	24	6	30	256
Typhoid and paratyphoid fever				18	4					22
Undulant fever				3				1	1	5
Venereal diseases:										
Gonorrhea	1	31	16	81	120	42	20	30	73	414
Syphilis	5	10	28	145	101	10	4	17	31	351
Other forms				1						1
Whooping cough		33		133	36	5	10	25	35	277

[1] Includes 8 cases, delayed reports.

CUBA

Habana—Communicable diseases—4 weeks ended October 14, 1944.—During the 4 weeks ended October 14, 1944, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis		1	Measles	2	
Diphtheria	20		Scarlet fever	1	
Dysentery, unspecified	7	1	Tuberculosis	5	1
Malaria	4		Typhoid fever	21	2

Provinces—Notifiable diseases—4 weeks ended November 4, 1944—During the 4 weeks ended November 4, 1944, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	4	6	1	12	24
Chickenpox		1					1
Diphtheria		25	4	2			31
Hookworm disease			13				13
Leprosy			1				1
Malaria	2	14	3	4	5	230	258
Measles		1				2	3
Poliomyelitis		1					1
Tuberculosis	7	19	18	24	16	47	131
Typhoid fever	15	52	13	33	5	35	153

[1] Includes the city of Habana

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE —Except in cases of unusual incidence only those places are included which had not previously reported any of the above mentioned diseases except yellow fever during the current year All reports of yellow fever are published currently

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month

(Few reports are available from the invaded countries of Europe and other nations in war zones)

Plague

Bechuanaland —From the beginning of the outbreak in October 1944, up to November 14, 1944, a total of 171 cases of plague with 90 deaths were reported in Bechuanaland. These figures include 30 deaths from plague reported in the region of Ngami Lake All measures are being taken to prevent the spread of the disease.

Belgian Congo —Plague has been reported in Belgian Congo as follows Week ended October 7, 1944, 5 cases, 3 deaths, week ended October 14, 1944, 1 case, 1 death

French West Africa—Dakar —For the week ended October 28, 1944, 15 cases of plague with 14 deaths were reported in Dakar, French West Africa

Madagascar —Plague has been reported in Madagascar as follows: October 1–10, 1944, 3 cases, October 11–20, 1944, 4 cases.

Morocco (French)—Casablanca region —For the period October 11-20, 1944, 18 cases of plague were reported in Casablanca region, French Morocco.

Sudan (French)—Bamaku.—For the week ended October 28, 1944 1 death from plague was reported in Bamaku, French Sudan.

Smallpox

Belgian Congo.—Smallpox has been reported in Belgian Congo as follows. Week ended October 7, 1944, 210 cases; week ended October 14, 1944, 318 cases, 3 deaths.

Union of South Africa.—For the month of August 1944, 346 cases of smallpox with 38 deaths were reported in the whole Union of South Africa.

Typhus Fever

Egypt.—For the week ended October 14, 1944, 36 cases of typhus fever with 2 deaths were reported in Egypt.

Gibraltar.—For the week ended October 21, 1944, 1 case of typhus fever was reported in Gibraltar.

Morocco (French).—For the period October 11–20, 1944, 28 cases of typhus fever were reported in French Morocco.

Turkey.—Typhus fever has been reported in Turkey as follows: Week ended November 4, 1944, 15 cases; week ended November 11, 1944, 35 cases.

Yugoslavia.—For the period September 1–7, 1944, 377 cases of typhus fever were reported in Yugoslavia, including 198 cases reported in Croatia and 179 cases reported in Bihac.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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PATHOLOGIC REACTION IN GUINEA PIGS TO THE HUMPHREYS' VIRUS STRAIN[1, 2]

By T. L. PERRIN,[3] *Surgeon*, and E. A. STEINHAUS, *Associate Bacteriologist, United States Public Health Service*

This study was undertaken by Surgeon T. L. Perrin while in the Pathology Laboratory of the National Institute of Health, in cooperation with Associate Bacteriologist E. A. Steinhaus in the Rocky Mountain Laboratory. Both guinea pigs and mice were inoculated intraperitoneally with the Humphreys' virus, at that time thought to be a new virus, and killed after varying intervals by Dr. Steinhaus. He performed immediate autopsies and forwarded the tissues in 3.8 percent formaldehyde solution to Dr. Perrin at Bethesda. Paraffin sections of various organs were prepared and routinely stained with buffered azure eosin and iron hematoxylin-picrofuchsin. Frozen sections of heart, liver, and kidney were regularly stained with oil red O for fats. The ferrocyanide reaction was done on all spleen sections.

Grossly, the principal findings in guinea pigs were enlargement and deepening of color of the spleen, small focal necroses in the liver, enlargement and hemorrhage of inguinal and sometimes axillary lymph nodes, and fluid contents in the gastrointestinal tract. Splenic enlargement was first noted 3 days after inoculation, on the second day of fever. It was never marked, being recorded usually as moderate up to one and one-half times normal, once two times normal. Small white focal lesions in the liver, up to fair-sized areas or necrosis, appeared first in 2 of 3 guinea pigs killed on the third febrile day, or 4 days after inoculation. They were noted in all 3 animals killed on the fourth febrile day, in none on the fifth, larger foci in all 3 on the sixth febrile day, in 2 of 3 killed on the seventh day from onset of fever (8 days after inoculation), and in both guinea pigs killed 9 days after

[1] From the Pathology Laboratory (Bethesda, Md.) and the Rocky Mountain Laboratory (Hamilton, Mont.), National Institute of Health
[2] Manuscript was completed for Perrin and Steinhaus by Senior Surgeon R. D. Lillie.
[3] Now on duty with the U. S. Coast Guard.

inoculation. Swelling of inguinal lymph nodes was first noted 2 days after inoculation, hemorrhage 5 days after inoculation. Enlargement was slight on the first to third febrile days and was noted only in 4 of 9 guinea pigs; on the fourth and fifth febrile days the inguinal nodes were more or less enlarged and regularly hemorrhagic in all 6 guinea pigs. In animals killed on the sixth day from onset of fever (7 days after inoculation), no inguinal adenopathy was noted, while hemorrhagic inguinal nodes were noted in 4, and axillaries as well in 2 of these, among the 6 guinea pigs killed 8 and 9 days after inoculation. In 11 of the 12 guinea pigs killed 6 to 9 days after inoculation, the gastrointestinal contents were noted as liquid. This condition was not noted in animals killed earlier or in animals inoculated with uninfected spleen tissue and killed after the same interval.

Histologic examination of all but 2 of the experimental animals and of most of the controls was completed by Dr. Perrin, and most of his results tabulated before he was detached for sea duty.

Brain.—Slight to moderate focal lymphocyte infiltration of the meninges was noted in 6 guinea pigs, of which 1 was killed on the second day and 1 was a control. Five of these and 1 other showed slight focal lymphocyte infiltration about vessels in the parenchyma, with focal cellular gliosis in 4 of the 7. One of these and 1 other control animal presented granulomata containing encephalitozoa, so that lesions of one sort or another were present in 8 of the 36 brains studied (2 of 9 controls, 6 of 27 inoculated animals). Chorioid plexus was specifically noted as uninvolved in all 36.

Spinal cord and ganglia.—The only lesion noted was a bilateral calcification of part of the gray substance in 1 control guinea pig. Ganglia were found in the cross sections of the spinal column in 25 guinea pigs, 8 controls, and 17 inoculated. These also showed no lesions.

Spleen.—Splenic follicles showed no particular alteration. Usually a few mitoses were present, and often there was a little phagocytosis of nuclear fragments by follicle phagocytes. Guinea pigs killed 3 or more days after inoculation presented moderate to fairly marked congestion of pulp and sinuses, and with this there was a considerable increase in numbers of polymorphonuclear leucocytes and much phagocytosis of nuclear fragments by swollen pulp and sinus reticuloendothelial cells. The amount of yellowish-brown pigment also seemed increased in the same period, more in animals killed 5 to 9 days after inoculation, and then it was usually at least partly iron positive with acidulated potassium ferrocyanide. In later stages some peritrabecular and diffuse lymphoid cell infiltration was seen, but this was less than in control animals and megakaryocytes did not appear.

Vertebral marrow.—This was usually quite cellular. The cell picture was in general similar in experimental and control animals and focal lesions were absent during the first 3 days after inoculation. In animals killed 4 to 6 days after inoculation considerable numbers of pyknotic and fragmenting nuclei with cell necrosis and irregular cell depletion were seen. Adult polymorphonuclears continued present in usual numbers. Lesser similar changes were seen 7 and 8 days after inoculation in some animals, and thereafter the marrow appeared normal.

Lymph nodes.—Usually some mitoses and some phagocytic reticulum cells were present in the follicles in both cervical and mesenteric lymph nodes, in control as well as in experimental animals. Moderate to rather marked sinus dilatation was noted, more in mesenteric nodes, and was accompanied by more or less prominence of sinus endothelium. In mesenteric nodes the controls showed a similar status, but in cervical nodes sinus endothelium was more prominent in experimental than in control animals. More or less congestion was evident in mesenteric but not cervical nodes in animals killed 3 to 8 days after inoculation. Erythrophagia was rarely seen in cervical nodes, more often in mesenteric, and in these chiefly in animals killed 7 and 8 days after inoculation. Abscesses were seen in cervical nodes in 2 guinea pigs, 8 and 9 days after inoculation, but such lesions are not infrequent in guinea pigs.

Submaxillary glands.—These glands presented periductal and, less often, interstitial lymphocyte infiltration, perhaps more often in animals killed during the first 3 days of fever than thereafter, but also in control animals in equal grade though apparently less often. Intranuclear inclusions in duct cells of serous lobules were noted in 14 guinea pigs, of which 1 was a control animal.

Pancreas.—In 2 guinea pigs the pancreas presented focal lymphocyte infiltration and absence of secretion granules was noted in 1. These changes are probably not significant.

Liver.—Slight to moderate or even fairly pronounced congestion was noted in most of the inoculated animals. Slight portal lymphocyte infiltration was present in many, both controls and inoculated guinea pigs. The control animals usually showed only traces of fat in liver cells, or none, while in the experimental series, except for 2 guinea pigs killed 1 and 2 days after inoculation, there was a more or less severe, usually diffuse, loading of liver cells with fine and medium fat droplets. While occasional foci of coagulation necrosis were seen in the livers of 2 of the 10 control animals, and such may be found not infrequently in guinea pigs, the occurrence of liver necrosis in the experimental animals of this series is too great not to be significant. They were absent in 6 of 9 guinea pigs killed 1 to 3 days after inoculation and in 1

each killed 4 and 9 days after. The remaining 19—1 each 1, 2, 3, and 9 days after inoculation; 2, 4 days after; 3 each 5, 6, and 7 days after; and 4, 8 days after inoculation—all showed more or less numerous foci of coagulation necrosis. In the earlier examples polymorphonuclear and lymphocyte infiltration were often noted among coagulated cells, some, fibroblast proliferation was evident by the fourth day, and calcification and hyalinization of necrotic cells appeared on and after the fifth day. The proliferative reaction proceeded later to partial replacement of necrotic foci, and the fibroblasts were sometimes foamy and laden with fat droplets.

Stomach.—Occasional foci of cellular infiltration in various layers were observed in 3 control and 6 inoculated animals. One guinea pig (ninth day) showed focal hemorrhage and a small area of coagulation necrosis in antral mucosa. The significance of all of these changes is dubious.

Intestine.—Sections of colon or small intestine generally showed no lesions.

Peritoneum.—Omentum, mesentery, and broad ligament often presented patches of interstitial infiltration by lymphocytes, monocytes, and sometimes polymorphonuclear leucocytes. Infrequently mesothelial proliferation of slight grade was noted, and sometimes interstitial fibroblast proliferation. Such changes occurred both in inoculated and in control animals, and perhaps more often in those animals injected intraperitoneally 1 to 4 days previously than in those surviving 5 to 9 days. They may be related rather to the introduction of foreign material into the peritoneum than to the specific infection.

Kidney.—Congestion of slight to moderate grade was noted, most in animals killed 3 to 5 days after inoculation. Degenerative tubular changes were slight, chiefly manifest by the appearance of fat droplets in the epithelium of the cortical tubules, often in fair numbers, and tending to be patchy and irregular in distribution. It involved sometimes especially collecting tubules, sometimes deep convoluted. Intratubular exudate was more common in the later survivors; epithelial degeneration and necrosis of a few cells were seen in occasional animals throughout the course of the disease. Foci of medullary calcification were seen in 2 control and 2 inoculated animals.

Adrenal.—Congestion was noted between the third and eighth days; occasional patches of lymphocyte infiltration in the medulla were observed (6 guinea pigs). The cytoplasmic oxyphilia and partial cell separation observed in the reticular zone of the cortex in a number of guinea pigs occurred also in some of the controls, and this alteration may be artefact.

Testicle.—In the 13 males no significant changes were noted.

Ovary.—No lesions were noted, aside from thecal epithelial degeneration in 1 inoculated and 1 control animal.

Uterus and cervix.—In the 24 females no consistent lesions were noted.

Urinary bladder.—Focal lymphocyte infiltration of the mucosa was noted in 2, subepithelial edema, serosal thrombosis, and focal mucosal hemorrhage in 1 guinea pig each.

Heart.—Focal epicardial, interstitial, and endocardial lymphocyte infiltration and fibroblast proliferation in varying location and measure were observed in all animals, inoculated and controls, without appreciable significant differences. Fine fat droplet deposition in muscle fibers, slight to quite pronounced in grade, was seen in 14 of 26 inoculated and in none of 8 control animals. No frozen sections were made from 3 hearts.

Lung.—Peribronchial, periarterial, and interstitial lymphocyte infiltration with patchy septal thickening and focal alveolar exudates of varying character were absent in 1 inoculated and 1 control animal of the 36 from which lung sections were made, and among the animals with lesions it was not possible to distinguish controls from inoculated animals by quantity or character of the changes.

Thyroid and parathyroid.—No significant changes could be discerned in 15 thyroids from 11 inoculated and 4 control animals. There were no lesions found in the 9 parathyroids (5 inoculated, 4 controls).

Thymus.—Imbedded in the salivary glan l there is usually a mass of thymic tissue with characteristic cortex and medulla. The latter contains concentric epithelial masses which often show some parakeratosis, sometimes also polymorphonuclear infiltration, karyorrhexis and central necrosis. These changes in the epithelial bodies are often seen in a variety of other conditions as well as in the control and inoculated animals of the present series.

Appearing in 1 of 3 animals 4 days after inoculation and in all inoculated animals thereafter, and in no control animals, was a patchy to diffuse degeneration of the thymic cortex. In this process there was pyknosis and karyorrhexis of thymic cortical small cells, perhaps in less extensive degenerations more pronounced at the inner border of the cortex. Sometimes, too, adjacent to small clear spaces in the cortex were closely packed collections of nuclear fragments grouped about a single, well-preserved, leptochromatic nucleus of reticulo-endothelial cell type, suggesting phagocytosis. Such phagocytes were scattered throughout the cortex, but seldom appeared in the medulla. In some animals the process resulted in diffuse karyorrhexis of the greater part of the cortex.

Skeletal muscle.—In one section from 1 guinea pig there were 2 areas of quite severe degeneration, atrophy and necrosis of muscle fibers with some nuclear multiplication, interstitial fibroblast prolifer-

ation, and definite fibrosis. As this was found in an animal inoculated 7 days previously, its relation to the infection under study is dubious. In other inoculated and control animals a few foci of slighter similar degeneration were noted.

DISCUSSION

Infection with the Humphreys' virus strain in guinea pigs is characterized by fatty degeneration and focal necrosis of the liver, some fatty degeneration of kidney tubules and heart muscle, and diffuse cellular necrosis in spleen pulp, bone marrow, and thymic cortical tissue. In liver and spleen, polymorphonuclear infiltration attended the earlier stages of necrosis. Calcification was prominent in later stages of the liver necrosis.

Since it has been suggested that Humphreys' virus is a strain of lymphocytic choriomeningitis, it may be pointed out that fatty changes and focal necrosis of the liver in monkeys with choriomeningitis have been reported by Lillie, and that similar changes in mice have been observed by him. The latter species also showed fatty degeneration in the kidneys. Lillie and Armstrong reported in a study done in 1936–7, but not published at that time, that there were frequent foci of necrosis and granulomatous reaction in guinea pigs. Calcification was not noted and fatty changes were less conspicuous than in the present series. However, it is to be noted that choriomeningitic mouse livers which are heavily loaded with fat droplets by the present supersaturated isopropanol technique, are often fat-negative by the Herxheimer method which was in use at that time.

The diffuse necrosis seen in this series in thymic cortical tissue, spleen pulp, and bone marrow, was absent in Lillie and Armstrong's guinea pigs as well as in monkeys and mice. However, the early polymorphonuclear and later pronounced reticulo-endothelial and lymphoid cell reaction in the guinea pig spleen pulp are comparable to the present series, though there was little necrosis.

The virtual absence of meningeal lesions and almost complete lack of chorioidal foci in the present series contrasts with their presence in intracerebrally inoculated mice and monkeys reported by Lillie, and, more significantly, as their guinea pigs were inoculated subcutaneously or intraperitoneally, with the relative frequency of meningeal and plexal lesions found by Lillie and Armstrong.

In this series cardiac and pulmonary focal lesions were relatively dubious and inconspicuous; in Lillie and Armstrong's series they seemed relatively much more conspicuous, as also in Lillie's report on monkeys.

Focal infiltration by lymphocytes was prominent in Lillie's monkeys in kidneys, epididymis, uterus, and tube. Lillie and Armstrong

reported similar infiltrations in guinea pigs in the kidney, bladder, and epididymis, together with severe testicular degeneration. Such infiltrations were relatively inconspicuous in the present series, and testicular degeneration was infrequent and inconspicuous.

These findings indicate a considerable difference in organ pathogenicity between Humphreys' virus and Armstrong's lymphocytic choriomeningitis strain. This would tend to dispute rather than support a thesis for the identity of the two virus strains, but the differences may be at least partly assignable to a virulence differential of similar virus strains rather than to distinct and unrelated viruses.

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NOTES ON STATE LEGISLATIVE PROVISIONS FOR THE TEMPORARY LICENSING OF PHYSICIANS [1]

By ADELA STUCKE, *Assistant Statistician, United States Public Health Service*

This paper presents a brief analysis of State provisions for the temporary licensing of physicians, including new legislation enacted during 1943. The material is of current interest because of the part played by State licensure laws in restricting the interstate exchange of medical personnel and thus, in many instances, preventing the relocation of physicians to communities affected by wartime shortages of medical services. Furthermore, after the war licensure restrictions may impede the relocation of physicians discharged from the armed forces.

During the early part of 1942, various public and private agencies concerned with medical care sought to remove some of the legal restrictions imposed by State licensure laws and began to give special consideration to the possibility of temporary licensure for the period of the emergency. By October of that year, the Procurement and Assignment Service for Physicians, Dentists, and Veterinarians, in consultation with the Section on Federal-State Relations of the Department of Justice and other interested parties, had drafted a

[1] From the Division of Public Health Methods.

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model bill for presentation to the State legislatures. The bill authorized, and provided for, the temporary admission of out-of-State physicians to practice within a State. Approval was given to the model law at a joint meeting of the Directing Board of the Procurement and Assignment Service and the Executive Committee of the Federation of State Medical Boards held in early December. It was agreed, however, that wherever possible existing provisions for reciprocity between States and for interstate endorsement should be utilized. The legislation proposed or enacted as a result of this activity is described below.

Even before Pearl Harbor there were 11 States (Arizona, Arkansas, Florida, Georgia, Indiana, Kansas, Louisiana, Mississippi, Montana, New Mexico, and South Carolina) whose medical practice acts contained provisions for temporarily licensing physicians. (See table 1.) In most of these States the license is valid only from the date of issuance until the next regular meeting of the State examining board, and individuals applying for such temporary permits or certificates must have the same qualifications as applicants for permanent licenses. Ten of the acts allow the holders of temporary licenses to practice anywhere within the State, but the Arizona law limits the area of practice to a community where the applicant's services are needed in an emergency.

There are certain provisions of the medical practice acts of four other States (Kentucky, New Hampshire, New Jersey, and West Virginia) which, if broadly interpreted, might be used as a basis for authorizing the admission of physicians into those States to practice for a limited period. The Kentucky law [2] provides that the State board of health may grant to qualified persons a limited certificate to practice general medicine in a county or counties of the Commonwealth where it appears to the board that physicians are needed. The certificates are valid for a period of 5 years, unless revoked sooner, and are renewable at the discretion of the board. By an amendment to the statutes enacted some 15 years ago, New Hampshire empowered the State board of examiners "on account of war or other threatened or existing national calamity" to suspend, in whole or in part, that section of the medical practice act which prescribes the qualifications to be possessed by applicants.[3] In New Jersey the prohibitory provisions of the licensure law do not apply to a lawfully qualified physician or surgeon of another State who, on written permission of the board of medical examiners, takes charge of the practice of a New Jersey licentiate during his absence from the State.[4] The West Virginia law provides that "whenever in the judgment of the public

[2] Carroll's Kentucky Statutes, Baldwin's 1936 Revision, ch. 63, sec. 2613a-2.
[3] Public Laws of New Hampshire, 1926, as amended, title XXI, ch. 204, sec. 10.
[4] Revised Statutes of New Jersey, 1937, as amended, title 45, ch. 9, art. 1, sec. 45: 9-21.

TABLE 1.—*State laws passed before the present emergency which provide for temporary licensing of physicians*

State	Scope of law			Law citation
	Period of validity	Area of practice	Qualifications of applicants	
Arizona	Until next regular board meeting	Community where applicant's services needed in emergency	Graduate of recognized medical college whose services are needed as an emergency in community	Ariz Code Ann, 1939, off ed, ch 67, sec 67-1103
Arkansas	No longer than 2 months before next regular stated meeting of board	Statewide	Same as for applicant for permanent license	Pope's Digest of Ark Stats, 1937, as amended, ch 130, sec 10743
Florida	Until next regular board meeting	do	do	Fla Comp Gen Laws, 1927, as amended, div 1, title II, ch 17, sec 3410
Georgia	do	do	do	Ga Code, 1933, as amended, ch 84-9, sec 84-912
Indiana	do	do	do	Burn's Ind Stats Ann, 1933, title 63, ch 13, sec 63-1306
Kansas	do	do	do	Kans Gen Stats, 1935, as amended, ch 65, sec 65-1008
Louisiana	do	do	Pass examination	Dart's La Gen Stats, 1939, title 62, ch 31, sec 9648
Mississippi	do	do	Same as for applicant for permanent license, not issuable to a partnership	Miss Code, 1930, as amended, ch 148, sec 5856
Montana	do	do	Same as for applicant for permanent license	Mont Rev Codes, 1935, ch 267, sec. 3118
New Mexico	Until next board meeting and until second examination passed upon	do	Pass examination in all but 2 of designated subjects	N Mex Stats, 1929, as amended, ch 110, sec 110-105
South Carolina	Until next regular board meeting	do	Same as for applicant for permanent license	So Car Code, 1932, title 30, art 7, sec 5153

health council a condition exists in which medical service may be required, the council is authorized to grant permits for the practice of medicine to qualified physicians in prescribed areas, and such permits shall be subject to revocation when the agreement, under which they were issued, has been violated."[5]

Although 44 State legislatures convened in regular session during 1943, bills drafted along the lines of the model law approved at the December conference were introduced into the legislatures of only 7 of these States, to wit: Delaware, Kansas, Maine, Nevada, Pennsylvania, Vermont, and Washington. A bill of like nature was also introduced into the United States Congress for the District of Columbia for the second time in 2 consecutive years. In the States of Delaware, Maine, Nevada, Pennsylvania, and Washington, the bills were enacted into law (table 2).

Six of the proposed acts provided that a physician, in order to apply for a temporary permit, must be licensed to practice outside the State, and must be found qualified by the State examining board to practice within the State. In most of the bills the period during which temporary permits were to be valid was limited to 6 months after the present war emergency, and the State boards were authorized to impose special limitations on the practice of the holders of such permits. In only one State (Washington) and the District of Columbia were no restrictions proposed as to the area of practice; in the other six States the area of practice was to be confined to territorial limits determined by the State boards.

Legislation was introduced in 1943 in two other States (Colorado and New York) in an endeavor to effect a different solution to the problem of supplying health personnel to needy areas. It was proposed in Colorado (Senate bill 333) that the State board of health be authorized to declare emergency areas and to permit all full-time State, county, and municipal health officers to practice medicine for the period of the emergency, provided such officers had graduated from an approved medical school and had been licensed to practice in one of the several States. Charges were to be made for services of a private nature, the fees collected to be deposited in the general fund of the State or of a political subdivision, depending upon whether services were performed by a State or a local health officer. This bill died in the Senate. In New York the State War Emergency Act was amended by chapter 294 of the laws of 1943 (introduced as Assembly bill 335). This amendment authorized the Governor to designate certain regions as emergency health and sanitation areas if there were inadequacies of medical personnel or facilities therein. Under such conditions the State commissioner of health would be empowered to employ medical and health personnel to serve in the designated areas.

[5] West Virginia Code, 1943, sec. 2869.

TABLE 2.—*Scope and final disposition of State legislative proposals made in 1943 for temporarily licensing physicians during the war emergency*

State	Bill number	Scope				Final disposition
		Qualifications of applicants	Duration of license	Area of practice	Special limitations on practice	
Delaware	S 38	Any physician licensed outside of State and found qualified by State Medical Council	12 months renewable at discretion of Council	Within such limits as may be imposed by Council	Such restrictions as may be imposed by Council	Approved Mar 4
District of Columbia	H R 1457	Over 21, good moral character sufficient professional training	1 year, renewable, automatically terminates 6 months after end of war	State wide	None	In Committee
Kansas	H 91	Licensed outside of State and found qualified by Board of Medical Registration to practice in the State	Until present war emergency terminates	Within such limits as may be imposed by Board	Such restrictions as may be imposed by Board	Killed in House
Maine	H 328	do	Specified in temporary certificate	do	do	Effective Apr 5
Nevada	A 141	Any doctor found qualified by State Board of Medical Examiners	June 30, 1945	Within territorial limits determined by Board and specified in license such limitations to be changed at discretion of Board	None	Approved Mar 20
Pennsylvania	H 235	Must prove to State Board of Medical Examination and Licensure that possess license from another State and has satisfactory professional standing	6 months after cessation of hostilities	Communities where medical services needed as determined by Board with advice of State P & A S and of State Med Soc	do	Approved Apr 22
Vermont	H 49	Licensed outside of State and found qualified by State Board of Medical Registration to practice in the State	Until Mar 1, 1945, unless sooner revoked	Within such limits as may be imposed by the Board	Such restrictions as may be imposed by the Board	Killed in Senate
Washington	S 218	Licensed and qualified to practice outside of State and applicant for license in State.	Until next regular examination given by State Board of Examiners	State wide	None	Approved Mar 9

New Jersey, on the other hand, amended its law during 1943[4] so as to limit the time during which an out-of-State physician might take temporary charge of the practice of a New Jersey doctor to a period of not less than 2 weeks nor more than 4 months. The amendment also imposed a fee of $25 for a temporary license and authorized the board of medical examiners in its discretion to extend such license for further periods of 2 weeks to 4 months but not to exceed in the aggregate 1 year.

To summarize, 11 States had legislation before the present war emergency specifically empowering the State examining boards to grant temporary permits or certificates to practice medicine within the respective States; the provisions of the medical practice acts in 4 other States can be interpreted as permissive legislation for the admission of out-of-State physicians to practice for a limited period; and 6 States passed laws during 1943 which were designed to supply needed physicians to critical areas. By the end of 1943, only 16 States had statutory provisions for temporarily licensing physicians. Of these laws, 5, or less than one-third, were enacted as a direct consequence of the efforts of various groups to meet the urgent need for relocating health personnel to relieve certain medical care shortages precipitated by the war.

INFECTIOUS HEPATITIS: EXPERIMENTAL STUDY OF IMMUNITY[1]

By J. W. Oliphant, *Surgeon, United States Public Health Service*

In previous papers (*1*, *2*) the experimental production of jaundice following inoculation of human subjects with homologous serum or with yellow fever vaccines containing human serum was described. Evidence was also presented showing that the icterogenic agent was present in the blood of patients at some period before the appearance of jaundice but not 2½ months after its disappearance. It was therefore desirable to obtain more information concerning the question of immunity resulting from the induced infection; also to determine whether recovery from this condition results in immunity to the causative agent of spontaneously occurring infectious hepatitis.

On March 31, 1944, immunity and serum protection tests were set up as follows:

Group 1. *Immunity test.*—Ten individuals who had had experimental jaundice 12 to 18 months before, following inoculation with yellow fever vaccine containing human serum or with icterogenic human serum alone, received 0.5 ml. each of lot 367 yellow fever vaccine. This vaccine was kindly supplied by the Rockefeller Foundation and was one of the highly icterogenic lots which had produced jaundice in the personnel of the United States Army in 1942 (*3*).

[4] Revised statutes of New Jersey, 1937, as amended, title 45, ch. 9, art. 1, sec. 45. 9-21.
[1] From the Division of Infectious Diseases, National Institute of Health.

GROUP 2. *Serum protection test.*—Equal quantities of serum obtained from each of two persons who had recovered 1 to 3 months previously from homologous serum jaundice were pooled. Lot 367 dried yellow fever vaccine was suspended in this serum, which had been diluted 1:2 in normal saline solution. The final dilution of the vaccine was that recommended on the package and the dose of diluted vaccine employed was 0.5 ml. subcutaneously. Ten persons were thus inoculated.

GROUP 3. Ten apparently normal persons were similarly inoculated with 0.5 ml. of lot 367 yellow fever vaccine alone, as a control to the above two groups.

Cases of jaundice occurring in the three groups above are shown in the following table:

	Inoculum	Number in group	Number cases of jaundice
Group 1 (recovered persons).	Lo 367 dried yellow fever vaccine, 0.5 ml. subcutaneously.	10	0
Group 2 (normal persons).	Lot 3h7 dried yellow fever vaccine resuspended in 50 percent "immune" serum, 0.5 ml. subcutaneously.	10	1
Group 3 (controls)	Lot 367 dried yellow fever vaccine, 0.5 ml. subcutaneously.	10	3

Cross immunity test.—Serums obtained early in acute cases of spontaneous epidemic hepatitis which developed in Italy were obtained.

One of these specimens, No. 4–171,[2] which was employed as the inoculum appeared to be mildly icteric and was estimated to contain about 1 mg. bilirubin per 100 ml. On Jun. 29, 1944, 10 persons who had had homologous serum jaundice 6 to 19 months previously and 11 apparently normal persons were each inoculated subcutaneously with 0.5 ml. of this serum plus phosphate-buffered normal saline solution, the final serum dilution being 1:6. In the group of 11 normal controls there resulted 4 cases of jaundice, with incubation periods ranging from 85 to 106 days. In the group of 10 recovered persons there have been no cases of jaundice to date, November 8, 1944.

DISCUSSION

It has been rather generally suspected for some time that "homologous serum jaundice" and infectious hepatitis have the same etiologic agent. Clinically and pathologically the conditions are indistinguishable. The available evidence indicates that the incubation period of spontaneous infectious hepatitis is about 30 days; that of homologous serum jaundice is usually much longer. Why this should be so is unexplained.

The present study indicates that recovery from homologous serum jaundice results in immunity to reinoculation with serum from acute

[2] Received through the courtesy of Dr. Thomas Francis, Jr., to whom it had been sent through the Preventive Medicine Service, Office of the Surgeon General, U. S. Army, by the Commanding Officer of the 15th Medical General Laboratory at the suggestion of Colonel William S. Stone, M. C., chief, Preventive Medicine Service, Office of the Chief Surgeon, North African theater of operations.

cases of infectious hepatitis or with icterogenic yellow fever vaccine, and that the immunity persists for at least 12 to 18 months. Pooled serums from 2 patients, drawn 1 to 3 months following recovery from homologous serum jaundice, when mixed with icterogenic serum failed to protect 1 of 10 individuals inoculated with this mixture.

SUMMARY

Ten persons who had had jaundice 12 to 18 months before, following inoculation with icterogenic human serum or yellow fever vaccine containing human serum, did not develop jaundice upon reinoculation with icterogenic yellow fever vaccine. Among 10 normal similarly inoculated controls 3 developed jaundice.

Among 10 normal individuals inoculated with icterogenic yellow fever vaccine suspended in 50-percent convalescent serum from homologous serum jaundice patients 1 subsequently developed jaundice, while among 10 controls given vaccine alone there were 3 cases of jaundice.

Serum obtained from a case of spontaneous jaundice in Italy produced typical "homologous serum jaundice" in 4 of 11 normal persons. In 10 controls who had had inoculation jaundice, no jaundice was induced by the same serum.

REFERENCES

(*1*) Oliphant, J. W., Gilliam, A. G., and Larson, C. L.: Jaundice following administration of human serum. Pub. Health Rep., **58**:1233 (Aug. 13, 1943).
(*2*) Oliphant, J. W.: Jaundice following administration of human serum. Harvey Lecture, March 16, 1944. Bull. N. Y. Acad. Med., **20**:429, (August 1944).
(*3*) Sawyer, W. F., et al.: Jaundice in Army personnel in the western region of the United States and its relation to vaccination against yellow fever. Am. J. Hyg., **39**:337 (May 1944), **40**:35 (July 1944).

ANNOUNCEMENT OF ANNUAL MEETING OF AMERICAN PUBLIC HEALTH ASSOCIATION

The Executive Board of the American Public Health Association has announced that the third wartime conference and seventy-fourth annual meeting, and meetings of related organizations, will be held in Chicago, Ill., the week of September 17, 1945, with headquarters in the Hotel Stevens.

At its annual meetings this professional society of public health workers brings together the health officials of the Western Hemisphere for discussion of local, national, and international health problems. The Chicago program will cover subjects of interest to health officers, public health nurses, laboratory workers, nutritionists, vital statisticians, engineers, child and maternal health specialists,

health educators, public health dentists, epidemiologists, industrial hygienists, and others working in the broad field of health protection and promotion.

The related organizations will include the American School Health Association, the conference of State and municipal public health engineers, of public health nursing directors, of professors of preventive medicine, of State and provincial public health laboratory directors, of State directors of public health education, and of industrial health consultants.

The Illinois committee in charge of local arrangements will be headed by Dr. Herman N. Bundesen, president, Chicago board of health, and Dr. Roland R. Cross, State director of public health, Springfield, Ill., cochairmen.

The headquarters office of the American Public Health Association is located at 1790 Broadway, New York 19, N. Y. Reginald M. Atwater, M. D., is executive secretary.

DEATHS DURING WEEK ENDED NOVEMBER 18, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended November 18, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	9,143	9,040
Average for 3 prior years	8,930	
Total deaths, first 46 weeks of year	412,943	420,065
Deaths, under 1 year of age	611	632
Average for 3 prior years	590	
Deaths under 1 year of age, first 46 weeks of year	28,533	30,347
Data from industrial insurance companies:		
Policies in force	66,898,575	66,046,335
Number of death claims	14,054	11,418
Death claims per 1,000 policies in force, annual rate	11.0	9.0
Death claims per 1,000 policies, first 46 weeks of year, annual rate	10.0	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 25, 1944

Summary

Following last week's sharp increase in the reported number of cases of meningococcus meningitis (204 cases), the incidence declined to 141 cases for the current week, as compared with 195 for the corresponding week last year, and a 5-year (1939–43) median of 35. For some reason this disease usually shows considerable weekly fluctuations. Only 3 States reported more than 8 cases—New York (28), Ohio (16), and Pennsylvania (11). The cumulative total to date is 15,126, as compared with 16,256 for the same period in 1943. The weekly figures for the current year, while constantly above the expectancy, have been continuously below those for the corresponding weeks of last year since early in March. Since the week ended September 9, which was the week of lowest incidence this year (110 cases), 1,645 cases have been reported, as compared with 2,234 for the same period last year and a 5-year median of 341 for the same period.

A total of 221 cases of poliomyelitis was reported, as compared with 288 last week and a 5-year median of 150. The total number of cases reported to date is 18,711, as compared with 11,993 for the corresponding period last year and a 5-year median of 8,693 for the same period.

Weekly figures for influenza, measles, smallpox, typhoid fever, and whooping cough are below the respective figures for last week, the corresponding week last year, and the 5-year medians. Figures for diphtheria and scarlet fever, while below those for last week, are above figures for both the medians and the corresponding week last year. A cumulative total of 23,866 cases of scarlet fever has been reported since the week ended August 26, the lowest weekly incidence of the year, as compared with 26,430 for the same period last year and a 5-year median of 23,395.

Deaths registered in 93 large cities of the United States during the week totaled 8,477, as compared with 9,143 last week and a 3-year (1941–43) average of 8,648. The cumulative total is 421,420, as compared with 428,828 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 25, 1944, and comparison with corresponding week of 1943, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Nov 25 1944	Nov 27 1943		Nov 25 1944	Nov 27 1943		Nov 25 1944	Nov 27 1943		Nov 25, 1944	Nov 27 1943	
NEW ENGLAND												
Maine	2	4	1		31		2	70	64	0	0	0
New Hampshire	0	0	0				0	5	5	1	3	0
Vermont	0	1	0				3	23	23	0	0	0
Massachusetts	7	6	4				77	158	197	9	11	3
Rhode Island	0	0	1	23			0	38	3	2	1	0
Connecticut	1	3	0	1	1	1	15	3	60	0	6	1
MIDDLE ATLANTIC												
New York	14	15	14	[1] 1	[1] 3	[1] 7	69	321	257	28	24	7
New Jersey	4	2	2	2	7	7	9	269	27	4	6	2
Pennsylvania	10	11	12		1		32	204	332	11	16	3
EAST NORTH CENTRAL												
Ohio	11	8	17	5	12	12	17	1 434	34	16	10	1
Indiana	14	9	13	4	3	7	9	111	17	4	0	0
Illinois	4	9	13	1	6	6	17	40	35	8	10	4
Michigan [2]	17	12	12		1	1	18	364	183	7	8	2
Wisconsin	0	3	3	10	19	19	15	328	157	3	5	0
WEST NORTH CENTRAL												
Minnesota	14	17	1		270	1	5	352	59	4	5	0
Iowa	5	1	6	1		1	8	23	23	0	0	0
Missouri	10	6	9	1	149	3	2	5	7	0	8	1
North Dakota	8	6	5		5	1	2	222	1	0	0	0
South Dakota	0	2	2				2	9	2	0	0	0
Nebraska	2	9	5		3		11	14	5	0	2	0
Kansas	2	7	6	1	5	3	3	7	20	1	1	0
SOUTH ATLANTIC												
Delaware	0	0	1				2	11	2	2	1	0
Maryland [2]	4	11	10	6	6	5	0	16	16	1	12	1
District of Columbia	0	2	1	1	4	1	3	4	3	2	0	0
Virginia	12	13	41	139	259	157	3	372	48	1	6	3
West Virginia	2	3	10	1	5	13	5	20	14	2	3	1
North Carolina	20	24	35	2	7	5	4	55	55	1	0	1
South Carolina	4	4	15	415	331	331	8	27	4	2	2	0
Georgia	19	12	21	28	30	30	3	25	5	4	0	0
Florida	13	8	8	2	7	2	2	17	8	1	2	0
EAST SOUTH CENTRAL												
Kentucky	10	6	10	2	1	3	1	32	32	2	2	1
Tennessee	15	11	16	13	56	31	13	24	18	8	6	1
Alabama	23	21	21	18	54	54	1	62	10	2	1	1
Mississippi [2]	12	11	11							0	4	1
WEST SOUTH CENTRAL												
Arkansas	9	4	17	44	89	42	8	23	7	0	0	1
Louisiana	21	9	8	4	1	6	1	1	1	0	2	1
Oklahoma	17	8	11	64	74	47	6	3	2	0	1	0
Texas	66	37	43	837	807	539	26	27	27	5	7	2
MOUNTAIN												
Montana	8	0	2	1	6	6	1	97	16	0	0	0
Idaho	0	0	0	1			4	8	8	0	0	0
Wyoming	0	0	0	18	2	2	7	12	4	0	0	0
Colorado	4	3	6	9	12	12	7	80	26	1	1	1
New Mexico	5	2	2	2	4	1	0	1	3	1	1	0
Arizona	0	5	4	70	155	105	4	5	6	0	0	0
Utah [2]	0	0	0			7	7	2	25	0	2	1
Nevada	0	0	0				0	0	0	0	0	0
PACIFIC												
Washington	5	6	3	4	1	1	13	15	15	1	1	0
Oregon	7	2	1	9	11	18	18	43	25	0	5	0
California	34	42	25	21	27	36	138	70	70	7	20	1
Total	435	375	399	1 761	2 465	1 999	601	5 052	2 648	141	195	35
47 weeks	12 141	12 296	13 930	354 112	98 408	162 712	598 363	586 993	483 286	15 126	16 256	1 827

[1] New York City only

[2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended November 25, 1944, and comparison with corresponding week of 1943, and 5-year median— Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended—		Median 1939-43
	Nov 25, 1944	Nov 27, 1943		Nov 25, 1944	Nov 27, 1943		Nov 25, 1944	Nov 27, 1943		Nov 25, 1944	Nov 27, 1943	
NEW ENGLAND												
Maine	3	0	0	31	30	17	0	0	0	0	0	0
New Hampshire	0	2	0	13	5	5	0	0	0	1	0	0
Vermont	1	1	0	[illegible]	14	7	0	0	0	0	0	0
Massachusetts	4	4	1	223	158	158	0	0	0	0	1	1
Rhode Island	0	0	0	[illegible]	[illegible]	[illegible]	0	0	0	1	0	0
Connecticut	3	8	1	24	51	29	0	0	0	0	2	2
MIDDLE ATLANTIC												
New York	71	11	11	223	[illegible]	[illegible]	0	0	0	2	9	6
New Jersey	3	1	1	29	[illegible]	[illegible]	0	0	0	1	0	2
Pennsylvania	14	3	4	191	158	187	0	0	0	1	11	9
EAST NORTH CENTRAL												
Ohio	10	1	2	[illegible]	[illegible]	213	0	0	0	1	3	3
Indiana	6	0	2	83	[illegible]	72	1	0	1	0	1	1
Illinois	2	10	5	174	108	108	0	10	2	4	2	3
Michigan [2]	7	3	3	173	147	11	0	0	1	1	0	2
Wisconsin	0	4	4	81	139	139	0	0	0	1	3	0
WEST NORTH CENTRAL												
Minnesota	4	0	8	59	[illegible]	[illegible]	0	0	1	0	0	0
Iowa	1	2	2	52	[illegible]	[illegible]	0	0	0	0	0	0
Missouri	2	1	3	43	58	58	0	0	0	0	0	2
North Dakota	0	1	1	12	13	11	0	0	0	0	0	0
South Dakota	0	0	0	[illegible]	23	2	0	0	0	0	0	0
Nebraska	2	1	2	[illegible]	27	[illegible]	0	0	0	0	0	0
Kansas	1	4	2	82	[illegible]	89	0	1	0	1	0	3
SOUTH ATLANTIC												
Delaware	0	0	0	1	3	7	0	0	0	0	0	0
Maryland [2]	[illegible]	0	0	[illegible]	[illegible]	[illegible]	0	0	0	1	0	2
District of Columbia	0	0	0	21	21	14	0	0	0	0	1	0
Virginia	14	1	2	[illegible]	[illegible]	[illegible]	0	0	0	3	2	6
West Virginia	3	0	0	71	[illegible]	[illegible]	0	0	0	2	1	1
North Carolina	[illegible]	0	2	98	[illegible]	9	0	0	0	0	0	1
South Carolina	2	0	0	2	9	10	0	0	0	0	1	1
Georgia	0	0	0	44	18	37	[illegible]	0	0	0	0	5
Florida	3	0	0	11	9	7	0	0	0	1	2	2
EAST SOUTH CENTRAL												
Kentucky	9	2	2	34	[illegible]	79	3	0	0	0	6	4
Tennessee	3	2	3	84	[illegible]	98	0	0	0	3	4	3
Alabama	0	0	1	18	20	[illegible]	0	0	0	1	0	1
Mississippi [2]	0	2	1	23	9	17	0	0	0	0	0	2
WEST SOUTH CENTRAL												
Arkansas	2	0	0	37	1	[illegible]	0	0	0	2	1	7
Louisiana	0	1	0	[illegible]	7	7	0	0	0	[illegible]	5	5
Oklahoma	1	8	1	31	75	23	0	0	0	0	2	2
Texas	7	9	3	93	75	68	0	0	0	8	7	6
MOUNTAIN												
Montana	1	3	1	22	32	28	0	0	1	4	1	0
Idaho	0	0	1	[illegible]	27	6	1	0	0	0	0	0
Wyoming	0	0	0	7	2	4	0	0	0	0	0	0
Colorado	1	1	1	71	37	29	0	0	0	1	1	1
New Mexico	1	1	0	15	4	[illegible]	0	0	0	1	0	1
Arizona	1	0	0	11	5	[illegible]	0	0	0	0	1	1
Utah [2]	1	7	1	18	93	12	0	0	0	0	1	1
Nevada	0	0	0	4	0	0	0	0	0	0	0	0
PACIFIC												
Washington	5	10	1	54	66	21	0	0	0	5	0	1
Oregon	10	17	3	51	43	25	0	0	0	0	2	2
California	12	29	13	239	201	160	0	0	0	2	0	5
Total	221	150	150	3 027	2 930	[illegible]	5	11	14	54	70	126
47 weeks	18 711	11 993	8 603	172 105	124,926	124 926	[illegible]	[illegible]	1 279	5 101	5 155	7 956

[2] Period ended earlier than Saturday

[3] Including paratyphoid fever reported separately as follows New Hampshire, 1 Rhode Island, 1, Texas, 2

Telegraphic morbidity reports from State health officers for the week ended November 25, 1944, and comparison with corresponding week of 1943, and 5-year median—Continued

Division and State	Whooping cough: Week ended— Nov 25, 1944	Whooping cough: Week ended— Nov 27, 1943	Whooping cough: Median 1939–43	Week ended November 25 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis infectious	Leprosy	Rocky Mt spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	23	3	29	0	0	0	0	0	0	0	0	0
New Hampshire	0	2	6	0	0	0	0	0	0	0	0	0
Vermont	39	31	[illegible]1	0	0	0	0	0	0	0	0	0
Massachusetts	133	95	134	0	0	7	0	1	0	0	0	0
Rhode Island	1	26	22	0	0	2	0	1	0	0	0	0
Connecticut	70	23	73	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	202	284	439	0	0	15	0	1	0	0	0	0
New Jersey	64	90	147	0	4	0	0	0	0	0	0	0
Pennsylvania	101	127	279	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	114	133	211	0	0	0	0	0	0	0	0	0
Indiana	6	18	26	0	0	0	2	0	0	0	0	0
Illinois	42	132	132	0	2	8	0	1	0	0	2	0
Michigan [2]	69	222	279	0	0	9	0	0	0	0	0	0
Wisconsin	79	172	172	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	48	41	50	0	3	2	0	0	0	0	0	0
Iowa	4	28	20	0	0	0	0	0	0	0	0	0
Missouri	19	16	20	0	0	0	1	0	0	0	0	0
North Dakota	12	5	6	0	0	0	1	0	0	0	0	0
South Dakota	4	8	3	0	0	0	0	0	0	0	0	0
Nebraska	5	27	8	0	0	0	0	0	0	0	0	0
Kansas	32	39	48	0	0	1	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	3	11	14	0	0	0	0	0	0	0	0	0
Maryland [2]	70	53	53	0	0	0	1	0	0	0	1	0
District of Columbia	4	3	10	0	0	0	0	0	0	0	0	0
Virginia	42	109	51	0	1	0	69	0	0	1	0	0
West Virginia	4	17	17	0	1	0	0	0	0	0	0	0
North Carolina	44	190	102	0	0	0	0	0	0	1	0	5
South Carolina	26	50	31	0	0	6	0	0	0	0	0	1
Georgia	4	4	15	0	0	0	0	0	0	0	0	45
Florida	24	4	6	0	3	0	0	0	0	0	0	14
EAST SOUTH CENTRAL												
Kentucky	16	91	67	0	0	0	0	0	0	0	2	0
Tennessee	33	25	26	0	0	0	3	1	0	0	0	3
Alabama	21	11	17	0	0	0	0	0	0	0	0	19
Mississippi [2]				0	0	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	10	8	8	0	0	8	0	0	0	0	0	0
Louisiana	0	7	4	0	0	1	0	0	1	0	0	8
Oklahoma	8	2	7	0	0	6	0	0	0	0	0	0
Texas	125	89	89	0	2	576	36	1	0	0	1	39
MOUNTAIN												
Montana	15	16	16	0	0	0	0	0	0	0	0	0
Idaho	3	3	2	0	0	0	0	0	0	0	0	0
Wyoming	0	1	5	0	0	0	0	0	0	0	0	0
Colorado	31	33	17	1	0	0	0	0	0	0	0	0
New Mexico	0	4	4	0	[4] 0	7	6	1	0	0	0	0
Arizona	3	23	10	0	0	0	15	0	0	0	0	0
Utah [2]	2	14	20	0	0	0	0	0	0	0	0	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	18	32	32	0	0	0	0	0	0	0	0	0
Oregon	2	15	15	0	0	0	0	0	0	0	0	0
California	92	117	152	0	1	7	0	1	1	0	0	1
Total	1,667	2,455	3,243	1	17	656	134	9	2	2	6	136
Same week 1943	2,455			1	49	526	16	10	0	3	10	134
Same week 1942	3,243			1	27	166	41	10	0	1	19	63
47 Weeks 1944	86,588			39	1,685	22,341	8,301	598	31	453	506	4,805
47 Weeks 1943	166,704			62	1,946	15,802	7,007	633	27	433	724	4,034
47 Weeks 1942	162,372		[4] 162,372	73	1,117	11,531	6,179	532	43	[4] 451	789	[4] 2,656

[2] Period ended earlier than Saturday

[4] 5-year median 1939–43

NOTIFIABLE DISEASES, THIRD QUARTER 1944 [1]

The figures in the following table are the totals of the monthly morbidity reports received from the State health authorities for July, August, and September 1944. These reports are preliminary and the figures are therefore more or less incomplete. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but owing to population shifts and the presence of large military populations in certain States, the figures for some States are not comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State. The lists of diseases required to be reported are not the same for each State. Only 12 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported, and the figures are included although manifestly incomplete. There are also variations among the States in the degree of completeness of reporting of cases of the reportable diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating a trend by providing a comparison with similar preliminary figures for prior years. To some extent they also give a picture of the geographic prevalence of certain diseases, as the States are arranged by geographic location.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for July, August, and September 1944

Division and State	Anthrax	Chickenpox	*Conjunctivitis [2]	*Diphtheria	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria	*Measles	*Meningitis, meningococcus	Mumps	Ophthalmia neonatorum	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine	1	182	....	6	....	....	....	1	26		11	1	228	11	18	....	....	90
New Hampshire	....	19	....	....	....	....	....	....	2	....	....	....	61	6	64	....	....	2
*Vermont	....	149	....	1	....	....	....	....	33	....	....	....	52	1	93	....	....	7
Massachusetts	1	961	81	34	....	81	....	4	147	....	....	151	1,195	78	931	38	....	223
Rhode Island	....	73	....	8	....	7	....	6	6	....	84	73	60	14	25	....	....	25
Connecticut	....	212	2	6	....	18	....	2	50	4	5	16	278	41	141	1	....	207
MIDDLE ATLANTIC																		
New York	3	1,467	....	61	32	437	....	15	....	....	[3] 8	[4] 159	1,663	258	484	11	....	1,822
New Jersey	1	781	....	18	1	4	....	8	143	....	22	293	615	101	749	....	....	349
Pennsylvania	2	950	1	85	2	2	....	3	....	....	12	....	911	165	1,213	7	....	409
EAST NORTH CENTRAL																		
Ohio	....	575	....	67	4	3	....	3	14	....	37	52	227	78	154	130	....	450
Indiana	....	66	6	73	3	....	....	2	6	....	44	103	82	32	71	2	....	63
Illinois	....	452	....	46	16	20	....	21	44	....	32	14	318	109	421	118	....	988
Michigan	....	835	4	74	9	91	....	3	66	....	7	60	768	92	566	7	....	291
Wisconsin	....	1,140	....	21	3	....	....	1	159	....	105	8	1,681	44	1,062	....	....	818

WEST NORTH CENTRAL																		
Minnesota		237		92	41	11	1	12			5	10	217	31				27
Iowa		41		30				7	8			99	128	17	166			19
Missouri		37		30			12	2			9	79	155	88	147			194
North Dakota		37	3	23	1	15		30			16	1	16	8				161
South Dakota	1	41		25				2					45		12			18
Nebraska		18		18							35		97	5	65			15
Kansas		68	5	28	1	2		6	23	1	6	47	157	16	245			121
SOUTH ATLANTIC																		
Delaware		7			2							3	8	5	6			
Maryland		121	19	36	3	10	22	1	11		6	1	93	44	205	2		221
District of Columbia		39		2		18		2			3	48	95	11	34			86
Virginia		121		75	2		3 713	2			618	227	373	59	82		8	294
West Virginia	1	48		46	1	1	18				14	20	166	30	42			6
North Carolina		48		143		7					11	24	389	37			5	9
South Carolina		138		436	4	420			53	287	1 390	4 48	357	31	428	4	187	526
Georgia		22	24	104	1	85				990	252	157	108	19	152		9	130
Florida		25	12	86	43	4	1	4	15	1 352	23	149	416	36	188	2		375
EAST SOUTH CENTRAL																		
Kentucky		38		62	2	8	1				57	14	101	33	67			103
Tennessee	1	33		73	1		96	3	8	1	84	120	97	37	157	7	13	335
Alabama		15		197	67			4	5		111	1 510	79	57	191		17	400
Mississippi		416		147	420	4 837				1 294	4 111	10 523	673	27	886	25	703	1 508
WEST SOUTH CENTRAL																		
Arkansas	1	19		59	14	544			16	2	234	687	165	13	112		21	154
Louisiana		11		74	21	129			7	94	53	812	57	18	144	43	12	459
Oklahoma		16		52	8	79	8	4		4	202	648	153	13	27		1	180
Texas		482		425	267	6 983	86	19			3 609	2 820	1 568	87	690	19	324	1 251
MOUNTAIN																		
Montana		146	30	43	2	1		6	19		43	10	26	7	149			81
Idaho		57	9	1					14		9		32	1	17			1
Wyoming		27	4	7	1			4	5		4	1	53	2	68			10
Colorado		196		65	1	13		20			64	[illegible]	99	18	178			95
New Mexico		15		52	1	46	44		3		10	7	49	1	19		1	107
Arizona		44		21	2	2	360	2	19		240	23	100	7	58	1	2	179
Utah		276				1		1	45		9	44	177	5	325			16
Nevada		13	4	3							2		84	2	48			13
PACIFIC																		
Washington		427		45	3	3	7	8	137		22		390	44	487			269
Oregon		158		21	4			1			42	58	384	23	152			69
California		2 305	6	230	35	150		21	792		121	312	4 216	229	3 136			598
Total	12	13 604	210	3 251	1 044	14 029	4 369	235	1 976	4 029	11 782	23 994	19 452	2 085	14 675	417	1 303	13 044
Third quarter, 1943	17	11 707		3 046	1 057	11 715	4 396	275	4 784	3 388	12 515	23 831	36 549	2 506	15 677	421	1 456	16 208
Median, 1939-43	18	11 767		3 101	1 009	10 745	631	323	6 3 540	5 091	10 223	31 701	24 405	332	15 677	274	2 214	13 414
Alaska		15		1		56	24		5		7				6			12
Hawaii Territory		117	1	5	15	197		2	67	11	105	731	2 735	13	486			14
Panama Canal Zone [6]		65		23	7	19						402	10		28			6 78

See footnotes at end of table.

Consolidated monthly State morbidity reports for July, August, and September 1944—Continued

Division and State	*Polio myelitis	Rabies in animals	Rabies in man	Rocky Mountain spotted fever	*Scarlet fever	Septic sore throat	*Smallpox	Tetanus	Trachoma	Trichinosis	*Tuberculosis all forms	Tuberculosis respiratory	Tularemia	*Typhoid and paratyphoid fever	Paratyphoid fever	Typhus fever	*Undulant fever	Vincent's infection	*Whooping cough
NEW ENGLAND																			
Maine	12				149	2		1			159	142		8		2	10	13	173
New Hampshire	56				13						62			1	1				18
Vermont	29				42			1			6			8			23	6	346
Massachusetts	291			1	657	12		2	1	4	747	702		62	51	1	12		831
Rhode Island	8				31						149	142		7	2		3		174
Connecticut	130				119	13			1	12	327	317		17	4		14		588
MIDDLE ATLANTIC																			
New York	4 619	61	1	10	906	111		14		11	3 602	3 357		111	27	4	64		1,982
New Jersey	377			[illegible]	210	12		3		24	858			20	1	2	15		834
Pennsylvania	1 137		1	5	814			2	1	1	1 324			78		1	25		1 092
EAST NORTH CENTRAL																			
Ohio	831	50		1	1 038		6	3	4	1	2 028	1 951	1	88	6	3	24	3	2,008
Indiana	267		2	10	238	6	4	2	8		900	870	2	44			25	99	219
Illinois	356	100		10	556	20		10	4	1	1 982	1 835	3	44	5		105	114	1,207
Michigan	736	17	1		564	98	6	5		3	1 603			36	12		23		1 171
Wisconsin	181				515	13	1				789			7			77		1 635
WEST NORTH CENTRAL																			
Minnesota	382				296	9		3			732		4	12	2		107	4	448
Iowa	124	20	[illegible]	2	188	1	1				236	236		32			111		98
Missouri	88	17		5	169	6		4	110		695		10	60			11		327
North Dakota	36				38			1	4		77	71		4				17	214
South Dakota	3				42	1	8	1	14		73	16		6			13		207
Nebraska	50				56		1				44								141
Kansas	85	2	1		233	7		3			183	171	1	32	1		46	31	445
SOUTH ATLANTIC																			
Delaware	58	1		2	16						45	45		2					20
Maryland	356	18		19	244	12		1			934	903		27	4	1	16	9	1 038
District of Columbia	155	28			66						519	481		7	1		1		26
Virginia	590			55	262	294	1				864	864	11	50	2	6	7		617
West Virginia	148		1	12	424	4	2				457			70	3		2		293
North Carolina	622			35	339	15	4				545	536	1	72		115	4		2,014
South Carolina	46	32		2	55	112		5			176		5	73	15	79	9		1,078
Georgia	70			8	133	36	3	4			479	478	7	102	23	482	70	22	190
Florida	62	1			49	76		6			288	284		55	14	260	10	83	214
EAST SOUTH CENTRAL																			
Kentucky	591			7	150	12	1				1 095	1 049	4	103			22		887
Tennessee	89		7	19	229	25	2	11	1		1,228		12	66	4	34	21	43	427
Alabama	74	29		8	160		1	18	1		727		2	170	114	460	29		279
Mississippi	89			7	83				26		526	509	10	71		63	19		3,100

WEST SOUTH CENTRAL																			
Arkansas	17	30			66	174	10	3	164		694		34	90	14	5	18		260
Louisiana	80	20	1	1	48	35		16			421	416	7	96	6	143	23		36
Oklahoma	29		1	8	42	20	1		42		711		3	53			15	3	97
Texas	103	165			356	291	1		55		1 982		14	295	15	735	157		2,569
MOUNTAIN																			
Montana	29			1	99	10			1		106	35	2	3			3	8	394
Idaho	3			2	82	1	1				[10] 55	[10] 55		10					44
Wyoming	4			8	32	1			8		13	12	16				2	2	83
Colorado	40			1	141	7					220		1	20	3	1	16		305
New Mexico	11	5		1	46	5			3		463	458		25			1		30
Arizona	23				62	3			90		223			12	1		13		249
Utah	11	5		7	112						44	43	12	5	1		7		482
Nevada	6			1	6	101			2		28		3	1			1	19	17
PACIFIC																			
Washington	95	1		1	337	16	2	3			485	467		17	4		9	26	240
Oregon	157			1	181	13	2				196			21	3		16	42	136
California	174	215	2		1 190			23	10	9	2 477	2 331		69	14	19	102		1 025
Total	13 530	817	17	257	11 912	1 574	58	14	599	66	32 577	18 776	165	2 262	353	2 416	1 301	544	30 308
Third quarter, 1943	8 186	490	9	234	12 080	927	62	151	757	24	29 998	17 688	208	2 503	326	1 770	1 187	905	46 158
Median, 1939–43	5 766	559	9	208	11 559	1 209	93	151	866	52	26 980	15 265	257	3 986		1 261	1 000	430	46 158
Alaska					1						[illegible]	74							21
Hawaii Territory	3				9	2		3	2		201	184		2	1	50	3		77
Panama Canal Zone [8]	1										[9] 14	[9] 14		11	2				[9] 2

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States, paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table.

[1] For reports for first and second quarters of 1944 see pages 816 and 1150 of the PUBLIC HEALTH REPORTS of June 23 and September 1, 1944, respectively.

[2] Includes cases of suppurative and keratoconjunctivitis and of pink eye.

[3] New York City only.

[4] Includes 82 cases with infection outside of New York State.

[5] 140 recurrent and out-of State cases were also reported.

[6] 4 year (1940–43) average.

[7] Off shipping.

[8] Includes the cities of Colon and Panama.

[9] In the Canal Zone only.

[10] Includes 30 cases, delayed reports.

Actinomycosis: Connecticut 1, Pennsylvania 1, Illinois 1, Michigan 2, Minnesota 3, South Dakota 1, Montana 1.

Botulism: Nevada 2, Washington 3, California 3.

Coccidioidomycosis: Kansas 1, Arizona 5, California 6.

Dengue: South Carolina 2, Mississippi 2, Arkansas 1, Texas 12, Hawaii Territory 57.

Diarrhea and enteritis: New Jersey 13 (diarrhea only), Ohio 633, Indiana 2 (diarrhea only), Michigan 14 (diarrhea only), Minnesota 7 (enteritis only), Maryland 66 (diarrhea only), South Carolina 2 481 (diarrhea only), Florida 6 (diarrhea only), New Mexico 73, Washington 64, California 8 (diarrhea only).

Dog bite: Illinois 3,540 (all animals), Michigan 2,464, Arkansas 194.

Food poisoning: Ohio 1, Indiana 3, Illinois 5, Louisiana 2, New Mexico 3, Washington 2, California 76.

Granuloma (unspecified): Ohio 10.

Granuloma inguinale: Missouri 8, Florida 49, Tennessee 8, Mississippi 226, Louisiana 25, Washington 10.

Impetigo contagiosa: Indiana 2, Illinois 32, Michigan 215, North Dakota 8, Kansas 30, Maryland 6, Montana 3, Wyoming 3, Oregon 62, Hawaii Territory 45.

Jaundice: Indiana 1, Illinois 10, Florida 8, Idaho 3, Arizona 2, Utah 6, Washington 10, California 97.

Lead poisoning: Minnesota 6.

Leprosy: New York 1, Ohio 1, Florida 1, Louisiana 3, Colorado 1, Nevada 1, California 2, Hawaii Territory 7, Panama Canal Zone 1.

Lymphogranuloma venereum: Missouri 24, Florida 50, Tennessee 20, Louisiana 43, Arizona 15, Utah 2.

Plague (human): Hawaii Territory 1.

Psittacosis: Maryland 1.

Puerperal septicemia: Ohio 1, Mississippi 58, New Mexico 3.

Rat bite fever: Maine 2, Tennessee 1.

Relapsing fever: Texas 6, Arizona 2, Nevada 2, California 3.

Rheumatic fever: Rhode Island 8, Indiana 3, Illinois 96, Michigan 44, North Dakota 5, Maryland 80, Georgia 5, Louisiana 1, Utah 36, Washington 28, California 234.

Ringworm: Michigan 143, Washington 39.

Scabies: Michigan 57, North Dakota 1, Kansas 9, Montana 15, Idaho 3, Wyoming 4, Oregon 54.

Silicosis: Montana 3.

Weil's disease: Massachusetts 2, Michigan 4, Hawaii Territory 4.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 18, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Death								
NEW ENGLAND												
Maine:												
Portland	0	0	0	0	0	0	2	2	6	0	0	[illegible]
New Hampshire:												
Concord	0	0	0	0	0	0	0	0	6	0	0	[illegible]
Vermont:												
Barre	0	0	0	0	0	0	0	0	0	0	0	[illegible]
Massachusetts:												
Boston	1	0	0	0	75	3	9	5	50	0	0	[illegible]
Fall River	0	0	0	0	0	0	2	0	5	0	0	[illegible]
Springfield	0	0	0	0	3	0	0	0	9	0	0	[illegible]
Worcester	0	0	0	0	2	0	4	0	11	0	0	[illegible]
Rhode Island:												
Providence	1	0	0	0	0	0	2	0	6	0	1	[illegible]
Connecticut:												
Bridgeport	0	0	0	0	0	0	0	0	1	0	0	[illegible]
Hartford	0	0	0	0	3	1	3	0	3	0	0	[illegible]
New Haven	0	0	0	0	0	2	1	2	2	0	0	[illegible]
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	0	1	0	1	7	3	3	0	0	[illegible]
New York	13	1	1	1	5	16	46	34	113	0	3	[illegible]
Rochester	0	0	0	0	21	0	2	8	1	0	0	[illegible]
Syracuse	0	0	0	0	0	0	3	1	2	0	0	[illegible]
New Jersey:												
Camden	0	0	1	1	0	0	4	0	2	0	0	[illegible]
Newark	0	0	1	0	2	5	9	0	6	0	0	[illegible]
Trenton	0	0	0	0	0	0	1	1	1	0	0	[illegible]
Pennsylvania:												
Philadelphia	0	0	1	1	5	6	25	1	57	0	1	[illegible]
Pittsburgh	2	0	1	0	2	2	16	0	13	0	0	[illegible]
Reading	0	0	0	0	2	1	2	0	2	0	0	[illegible]
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	0	0	1	2	9	3	21	0	0	[illegible]
Cleveland	0	0	3	0	5	6	19	4	37	0	0	[illegible]
Columbus	2	0	0	0	1	0	2	0	7	0	0	[illegible]
Indiana:												
Fort Wayne	0	0	0	0	0	0	3	1	4	0	0	[illegible]
Indianapolis	1	0	0	0	1	1	8	1	12	0	0	[illegible]
South Bend	1	0	0	0	0	1	0	0	3	0	0	[illegible]
Terre Haute	0	0	0	0	0	0	0	0	4	0	0	[illegible]
Illinois:												
Chicago	0	1	0	1	14	6	30	3	58	0	1	[illegible]
Springfield	0	0	0	0	2	0	2	0	2	0	0	[illegible]
Michigan:												
Detroit	16	0	0	0	1	2	8	3	59	0	0	[illegible]
Flint	0	0	0	0	0	0	3	0	0	0	0	[illegible]
Grand Rapids	0	0	0	0	0	0	1	0	3	0	0	[illegible]
Wisconsin:												
Kenosha	0	0	0	0	0	0	0	0	1	0	0	[illegible]
Milwaukee	0	0	1	1	2	0	4	0	15	0	0	[illegible]
Racine	0	0	0	0	2	0	0	0	6	0	0	[illegible]
Superior	0	0	0	0	0	0	0	0	0	0	0	[illegible]

City reports for week ended November 18, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	0	0	1	0	3	2	4	0	0	1
Minneapolis	6	0	0	1	3	0	6	1	9	0	0	5
St. Paul	0	0	0	0	1	2	12	1	11	0	0	13
Missouri												
Kansas City	1	0	0	0	0	1	6	1	13	0	0	2
St. Louis	5	0	1	0	0	4	18	4	11	0	0	9
Nebraska:												
Omaha	0	0	0	0	7	0	2	1	17	0	0	0
Kansas												
Topeka	0	0	0	0	0	0	0	0	3	0	0	4
Wichita	0	0	0	0	0	0	5	0	6	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	0	0	0	0	1	1	2	0	0	0
Maryland:												
Baltimore	8	0	4	2	1	2	5	0	48	0	1	77
Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Frederick	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0	3	0	2	1	10	1	17	0	0	7
Virginia												
Lynchburg	0	0	0	0	0	0	0	0	2	0	0	0
Richmond	0	0	2	0	0	1	3	0	16	0	0	1
Roanoke	0	0	0	0	0	0	2	0	2	0	0	0
West Virginia:												
Charleston	0	0	0	0	0	0	0	0	7	0	0	0
Wheeling	0	0	0	0	2	1	0	1	4	0	0	2
North Carolina.												
Raleigh	0	0	0	0	0	1	0	0	1	0	0	1
Wilmington	2	0	0	0	0	0	1	0	6	0	0	1
Winston-Salem	0	0	0	0	1	0	1	0	4	0	0	0
South Carolina												
Charleston	0	0	2	0	0	0	1	0	2	0	0	0
Georgia												
Atlanta	0	0	5	0	0	1	3	0	6	0	0	1
Brunswick	0	0	0	0	0	0	0	0	0	0	0	0
Savannah	0	0	4	0	0	0	1	0	1	0	0	0
Florida:												
Tampa	1	0	0	0	0	0	2	1	0	0	1	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0	0	0	12	0	4	0	11	0	1	7
Nashville	0	0	0	0	0	0	5	0	2	0	0	0
Alabama:												
Birmingham	1	0	0	1	0	0	4	0	5	0	0	0
Mobile	3	0	0	1	0	1	3	1	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	0	0	0	1	1	0	4	0	0	2
Louisiana:												
New Orleans	3	0	3	2	2	2	11	0	5	0	0	0
Shreveport	3	0	0	0	0	0	5	0	1	0	0	0
Texas:												
Dallas	9	0	1	1	1	3	2	0	9	0	0	2
Galveston	0	0	0	0	0	0	0	0	0	0	0	0
Houston	3	0	0	0	0	1	5	0	4	0	0	0
San Antonio	5	0	0	0	1	0	8	0	0	0	0	0

City reports for week ended November 18, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
MOUNTAIN												
Montana:												
Billings	0	0	0	0	0	0	0	0	0	0	0	1
Helena	0	0	0	0	0	0	0	0	1	0	0	3
Missoula	0	0	0	0	2	0	0	0	1	0	0	0
Idaho:												
Boise	0	0	0	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	4	0	1	2	2	1	2	1	7	0	0	6
Pueblo	0	0	0	0	0	0	2	0	1	0	0	0
Utah:												
Salt Lake City	0	0	0	0	1	0	1	0	7	0	0	4
PACIFIC												
Washington:												
Seattle	0	0	0	1	9	0	4	0	8	0	0	1
Spokane	0	0	0	0	0	1	3	0	6	0	1	0
Tacoma	1	0	0	0	1	0	0	0	1	0	1	0
California:												
Los Angeles	6	0	8	1	7	5	7	2	34	0	0	2
Sacramento	0	0	2	2	2	0	0	0	9	0	0	4
San Francisco	2	0	3	0	13	4	6	1	12	0	0	4
Total	102	2	48	20	220	88	382	91	852	0	11	520
Corresponding week, 1943	96	------	91	23	1,076	------	399	------	839	0	14	702
Average, 1939–43	95	------	124	[1] 27	[2] 689	------	[1] 367	------	720	1	23	995

[1] 3-year average, 1941–43.
[2] 5-year median, 1939–43.

Dysentery, amebic.—Cases: New York, 2; Chicago, 1; Charleston, S. C., 1; Tampa, 1; Los Angeles, 1.

Dysentery, bacillary.—Cases: Providence, 1; New Haven, 1, Buffalo, 1; New York, 53; Chicago, 1; Detroit, 4; Charleston, S. C., 7; Nashville, 1, Mobile, 1, Los Angeles, 6

Dysentery, unspecified.—Cases. Memphis, 1.

Leprosy.—Cases: New Orleans, 1.

Typhus fever, endemic.—Cases. Wilmington, N. C., 1; Atlanta, 9; Savannah, 1, Tampa, 2; Birmingham, 1; Mobile, 7; Little Rock, 1, New Orleans, 1; Galveston, 1; Houston, 8; San Antonio, 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,272,300)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.2	0.0	0.0	0.0	217	15.7	60.1	23.5	259	0.0	2.6	227
Middle Atlantic	6.9	0.4	2.3	1.9	17	14.3	53.2	22.2	93	0.0	1.9	69
East North Central	12.8	0.6	2.4	1.2	18	10.9	54.1	9.1	141	0.0	0.6	75
West North Central	24.7	0.0	2.1	2.1	25	14.4	107.2	20.6	153	0.0	0.0	70
South Atlantic	18.0	0.0	32.7	3.3	10	11.4	49.0	6.5	193	0.0	3.3	147
East South Central	29.5	0.0	0.0	11.8	71	5.9	94.4	5.9	112	0.0	5.9	41
West South Central	66.0	0.0	11.5	8.6	11	20.1	91.8	0.0	66	0.0	0.0	11
Mountain	33.3	0.0	8.3	16.6	42	8.3	41.6	8.3	141	0.0	0.0	116
Pacific	14.2	0.0	20.6	6.3	51	15.8	31.6	4.7	111	0.0	3.2	17
Total	15.6	0.3	7.3	3.1	34	13.4	58.3	13.9	130	0.0	1.7	79

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 4, 1944.—During the week ended November 4, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		30		157	139	49	30	31	42	478
Diphtheria		9	8	48	6	4	8	1		84
Dysentery, bacillary				4					1	5
German measles		1		10	23		5		7	46
Influenza					29	2			4	35
Measles			3	116	30	27	5	8	36	225
Meningitis, meningococcus				1						1
Mumps				165	19	4	2	14	43	247
Poliomyelitis					9	1				10
Scarlet fever		8	9	137	137	25	11	23	39	389
Tuberculosis (all forms)			3	76	56	9		4	31	179
Typhoid and paratyphoid fever			2	8	1				2	13
Undulant fever				1						1
Venereal diseases										
Gonorrhea		35	8	128	113	39	21	39	74	457
Syphilis		10	6	167	93	14	6	10	28	334
Whooping cough		24	10	139	43	16	9	21	57	319

CUBA

Habana—Communicable diseases—4 weeks ended November 11, 1944—During the 4 weeks ended November 11, 1944, certain communicable diseases were reported in Habana, Cuba, as follows.

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	23	3	Poliomyelitis		
Leprosy	1		Tuberculosis		
Malaria	7	1	Typhoid fever		

SWEDEN

Notifiable diseases—June–August 1944—For the months of June, July, and August 1944, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	June	July	August	Disease	June	July	August
Cerebrospinal meningitis	14	5	9	Poliomyelitis	50	86	257
Diphtheria	144	189	161	Scarlet fever	2,655	1,725	1,888
Dysentery	80	66	188	Syphilis	95	100	107
Encephalitis, epidemic	2			Typhoid fever	7	5	10
Gonorrhea	1,453	1,806	2,189	Undulant fever	5	1	5
Hepatitis, epidemic	345	321	450	Weil's disease	2	5	9
Paratyphoid fever	20	13	10				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Ecuador—Loja Province.—During the month of October 1944, 4 cases of plague with 1 death were reported in Loja Province, Ecuador.

French West Africa.—For the period November 1–10, 1944, 38 cases of plague with 17 deaths were reported in all of French West Africa, of which 17 cases were reported in Dakar.

Palestine.—Plague has been reported in Palestine as follows: Week ended October 28, 1944, 5 cases; week ended November 4, 1944, 6 cases.

Peru.—During the month of October 1944, plague was reported in Peru as follows: Ancash Department, 3 cases, 2 deaths; Lima Department, 2 cases, 2 deaths.

Senegal.—Plague has been reported in Senegal as follows: Rufisque, week ended November 4, 1944, 6 cases, 2 deaths; Thies, October 21–30, 1944, 1 fatal case.

Tunisia.—Plague has been reported in Tunisia as follows: October 11–20, 1944, 7 cases; October 21–31, 1944, 2 cases.

Smallpox

Belgian Congo.—Smallpox has been reported in Belgian Congo as follows: Week ended October 21, 1944, 156 cases; week ended October 28, 1944, 210 cases.

Typhus Fever

Chile.—For the period September 10 to October 7, 1944, 51 cases of typhus fever with 5 deaths were reported in Chile. Provinces reporting the highest incidence of the disease are: Santiago, 18 cases, 4 deaths; Concepcion, 10 cases, 1 death; Valparaiso, 7 cases; Antofagasta, 5 cases.

Ecuador.—For the month of October 1944, 108 cases of typhus fever with 14 deaths were reported in Ecuador. These figures include 80 cases of typhus fever with 8 deaths reported in Quito and 12 cases with 1 death reported in Tulcan.

Irish Free State—Galway County—Loughrea.—For the week ended November 4, 1944, 1 case of typhus fever was reported in Loughrea, Galway County, Irish Free State.

Peru.—For the month of September 1944, 90 cases of typhus fever were reported in Peru, including 58 cases reported in Junin Department, 9 cases in Apurimac Department, 8 cases in Puno Department and 6 cases in Arequipa Department.

Tunisia.—Typhus fever has been reported in Tunisia as follows: October 11–20, 1944, 35 cases; October 21–31, 1944, 30 cases.

Yugoslavia.—For the period September 8–14, 1944, 161 cases of typhus fever were reported in Yugoslavia, including 83 cases reported in Croatia, 68 cases in Bihac, and 10 cases in Brod.

Yellow Fever

Colombia.—Yellow fever has been reported in Colombia as follows: Amazonas Department, Caucaya, August 24, 1944, 1 death; Boyaca Department—Vasquez Territory, June 6, 1944, 1 death; Maripi, September 2, 1944, 1 death; Intendencia of Meta, Cumaral, July 1, 1 case (recovered).

COURT DECISION ON PUBLIC HEALTH

Industrial sewage—contract between city and corporation for disposal of.—(South Dakota Supreme Court; *Ericksen* v. *City of Sioux Falls et al.*,14 N. W. 2d 89; decided April 7, 1944.) The plaintiff, a citizen and resident taxpayer of the city of Sioux Falls, brought an action against the city, its governing board of commissioners, and a corporation owning and operating a packing plant in the city. The plaintiff sought to have declared invalid a contract between the city's governing board and the corporation relating to the disposition of the industrial sewage from the packing plant through the city sewage system and disposal plant and to procure an injunction restraining the further use of the said sewage system and plant for the disposal of the company's industrial sewage. In 1926 the city and the packing company first entered into a contract for the handling through the city sewage disposal system of the sewage originating in the packing plant. This contract had no time limit and either party could cancel it at will. The parties operated under it until March 1940 when it was amended. As amended, the contract provided, among other things, for certain treatment of the industrial sewage by the packing company before entering the city sewer system and for specified expenditures by such company in connection with the city system, such expenditures having relation to improvements, rehabilitation, replacements, equipment, and operation. It was also agreed that the company could send into the city sewer system all of its sewage for a period of 15 years. The judgment of the trial court was for the defendants and the plaintiff appealed to the Supreme Court of South Dakota. The conclusions of the latter court may be summarized as follows:

(*a*) The validity of the contract was involved in the litigation, and under a State statute a resident citizen and taxpayer was authorized to test in court any ordinance, resolution, or contract executed by the municipal authorities in any case where the validity of such action was challenged.

(*b*) The city could exercise its discretion and the courts would not interfere with its action unless it appeared to be unreasonable or arbitrary, where the statute empowered the city to regulate the use of sewers and neither defined the limits of that power nor prescribed the manner of its exercise.

(*c*) The courts will interfere to keep municipal authorities within the law and will interpose to prevent any action which is ultra vires because of some lack of antecedent legislative authority.

(*d*) A municipal corporation is a creature of the State constitution and statutes and possesses only such powers as these laws give it, together with only those incidental or implied powers as are necessary to enable it to perform designated and authorized functions.

(*e*) A city, as such, has no inherent powers and none of the attributes of sovereignty.

(*f*) The law's policy is to require of municipal corporations a reasonably strict observance of their powers.

(*g*) A city can only grant to a person or firm within its limits a license or permit to make proper connection and empty sewage into the system for such treatment and disposal as the city may from time to time provide, and it is not within the city's power to guarantee that it will successfully operate a sewage disposal plant or an adequate system. If the system or plant had to be closed for repairs or failed to receive or adequately purify the sewage, the city could not be held liable for resulting damages to any person whose sewage was thereby inadequately treated or excluded. Therefore, a city could not, by contract, assume any such liability or bind itself to receive and dispose of all the sewage which patrons might attempt to empty into its sewage system.

(*h*) The supervision and regulation of sewers is a police function of the city; hence the city, in granting permission for the use of the sewers in the first instance and for their continuing use, must retain control at all times, and any attempt by way of contract to deprive the city of that control is void.

(*i*) The city's police power cannot be bargained away by contract but must be available at all times for use to meet such public needs as may arise.

(*j*) Any license or permit to connect with the city sewers must necessarily at all times be contingent upon the ability of the sewage system and disposal plant to digest and dispose of the sewage involved.

(*k*) No one has any vested rights in the use of the sewers and the city cannot grant a vested right.

(*l*) If the system or plant will not handle sewage from a particular source because of its nature or quantity or if such sewage is of such character as to prevent the disposal plant from functioning, it is within the city's power to require the discontinuance of the sewer connection and it may be the duty of the city to do so.

(*m*) A permit or license by a city to make a sewer connection means only that the licensee may empty his sewage into the system so long as the system will take care of it and the city authorities permit. In its discretion, with which the courts will not interfere unless the action is clearly unreasonable and arbitrary, the city governing board may grant and revoke licenses or permits as may be warranted by the capacity and ability of the sewers and disposal plant and as the public interests may require.

(*n*) The amended contract in the instant case, by which the city authorities undertook to grant to the packing company the right to empty all of its sewage without limitation as to character or volume into the city system for 15 years, purported to grant far more than is embraced in the license or permit which the city was authorized to grant.

(*o*) The mere fact that one has expended considerable money to make the sewer connection gives him no vested right to retain the connection.

(*p*) The packing company acquired no rights in dealing with the city as it had in the past, beyond the city's authority to contract.

(*q*) The city could accept as voluntary contributions the money it had received from the packing company, but any such past payments, or future payments, neither imposed liability upon the city nor conferred vested rights or supervisory control upon the company.

(*r*) The amended contract between the city and the packing company was wholly unauthorized and void.

(*s*) It did not follow as a necessary consequence that injunction had to issue to restrain further use of the city's sewers by the defendant company. The issuance of the requested injunction was properly denied because (1) the injunction could be promptly nullified by the issuance of a new permit, and (2) a discontinuance of the sewage outlet through the disposal plant, if continued in force, might either jeopardize the public health or greatly injure the public interests.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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STUDIES ON NEUROMUSCULAR DYSFUNCTION [1, 2]

I. NEOSTIGMINE THERAPY OF NEUROMUSCULAR DYSFUNCTION RESULTING FROM TRAUMA. II. NEOSTIGMINE THERAPY OF HEMIPLEGIA, FACIAL PARALYSIS AND CEREBRAL PALSY. III. NEOSTIGMINE THERAPY OF CHRONIC RHEUMATOID ARTHRITIS AND SUBACROMIAL BURSITIS

By HERMAN KABAT, M. D., *Passed Assistant Sanitarian (R), United States Public Health Service*

INTRODUCTION

The value of neostigmine in providing relief from fatigue and weakness of skeletal muscle in myasthenia gravis has been well established. In poliomyelitis, Kabat and Knapp (*1*) found that neostigmine produced relaxation of muscle spasm, relief from pain, increase in strength, and improvement in muscular coordination. On the basis of these studies on poliomyelitis, as well as preliminary observations of the author on the effects of neostigmine on muscle spasm in chronic rheumatoid arthritis and acute fibrositis, and of Trommer and Cohen (*2*) on rheumatoid arthritis, it was considered worth while to explore the therapeutic possibilities of neostigmine in a variety of types of neuromuscular dysfunction. In this preliminary investigation it was not intended to obtain definitive information on the indications for and extent of usefulness of neostigmine, but rather to ascertain what disabilities appeared to respond sufficiently to justify detailed, controlled study.

MATERIAL

Patients selected for study were those suffering from chronic neuromuscular disability which had not been responding to routine therapy. In order to limit the work involved, it was decided to select for study patients who on the basis of theoretical considerations might be expected to respond to neostigmine, and whose disability was such that the effect of the drug could readily be evaluated.

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[1] From the Division of Public Health Methods.

[2] The author wishes to express his thanks to Assistant Surg. Gen. R. C. Williams, Medical Director W. S. Bean, and Medical Director W. F. Ossenfort for the cooperation extended at the several U. S. Marine Hospitals. Many of the cases reported were treated at the U. S. Marine Hospital, Norfolk, Va.

Except for a few cases referred to the author by various sources and treated as out-patients, the patients were hospitalized at the United States Marine Hospitals and had been under treatment for some time. The diagnosis had been established and the course of the disability observed by the staff of the hospital. Patients with chronic disability of various types were referred to the author by these staff physicians. From these referrals the author selected patients for neostigmine therapy on the basis of the following criteria:

1. Muscle spasm, contracture, paresis, or muscular pain appeared to play a major role in the disability.
2. There was no obvious evidence of psychiatric factors in the disability.
3. The disability could be demonstrated objectively.
4. The disability had been present for a considerable period of time, had not had spontaneous exacerbations or remissions, and was either not improving or improving so slowly that the effect of therapy could be evaluated.
5. The disability was not complicated by demonstrable anatomical lesions such as ankylosis, bony block, complete loss of innervation, or active inflammation.

METHOD

Careful records were kept describing the disability in detail, including measurements of range of passive motion in angles, and of strength in terms of motion against resistance. During the period of neostigmine therapy, other therapeutic measures, including physical therapy, were discontinued.

Neostigmine was injected subcutaneously once or twice daily. The routine dosage was 2 cc. of neostigmine methylsulfate[3] 1:2,000 solution (1 mg.), together with atropine sulfate, gr. 1/100 (0.65 mg.) or gr. 1/150 (0.43 mg.). The atropine was used to eliminate the unpleasant parasympathetic side effects of the neostigmine.

I. Neostigmine Therapy of Neuromuscular Dysfunction Resulting from Trauma

Following fractures and other traumatic conditions, troublesome sequelae frequently persist for a long period of time. These include muscle spasm, contracture, joint stiffness, pain referred to joints and muscles, muscular weakness, and atrophy.

RESULTS

A. Fractures.—Eight patients suffering from persistent joint stiffness, pain, weakness, fatigue, and limitation of motion following various types of fractures were given neostigmine therapy. In seven of these cases, significant improvement was noted during 1 to 3 weeks

[3] Furnished through the courtesy of Hoffman-LaRoche, Inc., Nutley, N. J.

of drug treatment. In five cases, definite improvement was observed in 24 hours.

Case 1.—C., female, age 47. Left Colles's fracture had been sustained 5 months before. The chief disability was marked weakness and fatigue, and atrophy of the left upper extremity. There was limitation of passive wrist motions, of supination, and of flexion of the fingers. The patient had failed to improve with physical therapy.

After 4 days of neostigmine therapy, she reported that she was using the left arm more normally without strain and fatigue. There was a striking increase in strength, so that some motions of the left arm were equal in power to the right and all motions could be carried out against strong resistance.

After 2 weeks, neostigmine therapy was discontinued. At this time, strength was normal in all motions of the left upper extremity except for slight weakness of grip and wrist motions. The limitation of finger flexion and of supination had disappeared and there was a significant increase in range of motion at the wrist. Two months after cessation of neostigmine therapy there had been no recurrence of disability.

Case 2.—O. C., female, age 33. Fracture of the left olecranon had been reduced by open operation and the fragments wired. After 2½ months, there was severe disability which was not responding to physical therapy. Examination revealed atrophy and marked weakness in all motions of the left upper extremity. The patient complained of pain in the elbow and in the muscles of the forearm and arm, and of weakness and fatigue. At the shoulder, passive abduction was limited at 90°, forward flexion at 100° At the elbow, the total range of motion was 24° (extension limited at 144°, flexion at 120°). She was only able to reach to within 4 inches of her forehead.

Within 24 hours after the first injection of neostigmine, the limitation of motion at the shoulder disappeared and the patient was able to raise the arm actively to the vertical without pain She was able, for the first time, to touch her forehead. Pain referred to the muscles was greatly diminished.

After 1 week of drug treatment, there was a significant increase in strength and increase in range of motion at the elbow. After 3 weeks of neostigmine therapy, the total range of motion at the elbow was 54°, an increase of 30°, and there was full range of motion at the shoulder. Muscular pain and fatigue had completely disappeared. The left arm showed great increase in strength and was now just perceptibly weaker than the right.

Case 3.—C., male, age 18. This patient had sustained a fracture dislocation of the left shoulder 3 years before and had injured it again 8 months previously. He had been in the hospital for 4 months receiving physical therapy for the disability, with no improvement. There was severe pain in the shoulder muscles on active and passive motion but no limitation of passive motion. There was marked weakness of the left upper extremity and definite atrophy.

Within 18 hours after initiation of neostigmine therapy, he was able to raise the arm to the vertical with practically no pain. After 1 week of treatment, there was considerable increase in strength and disappearance of the pain.

Case 4.—W., male, age 22. Nine months before, the patient had suffered a fracture of the lower third of the left tibia and fibula with severance of the peroneal nerve. The fractures were well united without displacement. He complained of severe pain in the calf muscles and sole of the foot on weight bearing, and this disability had not been showing significant improvement. The total range of dorsal-plantar flexion at the ankle was 20° and dorsiflexion was limited at 110°.

One week of neostigmine therapy resulted in great relief from pain and an

increase in range of motion at the ankle of 25°. The patient was walking with a cane. After 2 weeks of treatment, he was walking without support and was free from pain. There was no change in the peroneal paralysis.

Case 5.—S., male, age 54. This patient had suffered a compound fracture of the lower end of the left tibia and fibula and dislocation of the ankle joint 4 months before. He complained of stiffness and pain in the ankle which interfered with weight bearing and was not responding to physical therapy. Within 24 hours after starting neostigmine therapy, there was considerable relief from pain in the ankle and an increase in range of dorsiflexion of 12°. After 6 days of drug treatment, he was free from pain, walked without a limp and there was great improvement in range of ankle motion.

Case 6.—B., male, age 30. The patient had fractured the body of the second lumbar vertebra 7 months before. He now had marked lordosis and rigidity of the lumbar spine and severe continuous pain which did not respond to rest and physical therapy. X-ray revealed almost complete disintegration of the lower half of the body of the second lumbar vertebra.

The pain disappeared several hours after the first neostigmine treatment and he was free from pain during 9 days of drug therapy. There was an increase in range of straight leg raising of 15° but no change in the rigid lordotic lumbar spine. One week after stopping the treatment, there had been no recurrence of pain.

Case 7.—H., male, age 34. This patient had had pain and muscle spasm in the back for 3 months from a fracture of the right transverse processes of the third and fourth lumbar vertebrae. The pain was relieved by neostigmine in a few hours and the limitation of motion disappeared in 1 week. One week after cessation of therapy, there had been no recurrence of disability.

Case 8.—W., male, age 20. Fracture of the lower third of the right femur and amputation below the knee had occurred 4 months before. External skeletal fixation of the right femur had been removed several weeks before. He had a flexion deformity of the knee of 15° and marked limitation of knee flexion. The day after starting neostigmine therapy, he was able to straighten the knee and this gain was retained. After 10 days of treatment, there was no improvement in range of knee flexion.

B. KNEE INJURIES.—Three patients suffered from internal derangement of the knee joint. Two to 8 months after meniscectomy, they continued to suffer from pain, weakness, and grinding in the joint. Physical therapy had been unsuccessful in relieving the disability. While neostigmine appeared to have some effect in improving strength and range of motion in these cases, it can only be considered as an adjunct to therapy, since the pain and grinding in the joint persisted unchanged.

Case 9.—D. R., male, age 19. Meniscectomy had been performed 5 months before. Five days of neostigmine therapy increased the range of knee motion 20° and enabled him to walk on the toes and the heels for the first time since the injury. The pain and grinding in the knee joint were unchanged.

Case 10.—B. S., male, age 22. Meniscectomy had been performed 8 months before. There was marked weakness of the right lower extremity. The knee tended to give way at each step and there was rapid fatigue on motion. He was unable to bear weight on the right leg in walking upstairs. After 6 days of neostigmine therapy, the patient was able to walk up three flights of stairs, bearing weight on the right leg without buckling at the knee and without fatigue. The pain and grinding in the knee joint remained unchanged.

Case 11.—B., male, age 21. Meniscectomy had been performed 2 months before. One week of neostigmine therapy resulted in an increase in motion at the knee of 10° but no improvement in the pain or the limp.

C. Ankle sprain.—In one case of ankle sprain, with disability persisting for 21 months despite intensive and continuous therapy, the dysfunction disappeared after 3 weeks of neostigmine treatment.

Case 12.—M., female, age 23. The patient had sustained a severe left ankle sprain without apparent fracture 21 months before. She had failed to improve from immobilization and physical therapy. She suffered severe pain in the ankle on weight bearing and walked with a decided limp. Dorsiflexion at the ankle was limited at 132° and the total range of dorsal-plantar flexion was 20°. Inversion and eversion were greatly limited. She was unable to walk on the toes or heel of the left foot and there was only the slightest flicker of active motion in the toes. There was definite atrophy of the calf muscles.

After 1 week of neostigmine therapy, she was moving her toes normally and there was an increased range of dorsiflexion of 20°. After 3 weeks of neostigmine treatment, the patient was able to use the ankle normally without pain. She walked without a limp and could walk on toes and heel with ease. There was no limitation in range of any motion at the ankle (dorsiflexion 98°) and motion of the toes was normal. The patient had danced for 3 hours one evening without disability or fatigue.

Two months after cessation of neostigmine therapy, there had been no recurrence of the disability.

D. Neuromuscular dysfunction following chronic infection.—Four patients had had chronic infections persisting for months or years which had finally healed. Disability consisting of joint stiffness, pain, marked weakness, and atrophy persisted. Neostigmine therapy was followed by rapid improvement in the disability in these cases.

Case 13.—R., male, age 36. Pain and disability in the left leg which had persisted for 4 months were found to be related to a deep abscess of the gluteal region. The abscess had been drained 1 month previously and the infection cleared up. However, the patient continued to complain of shooting pains down the leg, pain and muscle spasm in the hamstrings and anterior tibial muscles, and limitation of motion at the ankle. He walked with a decided limp. Eighteen hours after beginning neostigmine therapy, the disability had completely disappeared. Treatment was continued for 5 days and the patient was then discharged from the hospital to full activity.

Cases 14, 15, and 16.—Three patients had had chronic osteomyelitis [4] for from 1 to 5 years. Severe disability, consisting of marked limitation of motion, pain, and weakness persisted after the infection had cleared up. One patient had osteomyelitis of the femur, another of the tibia, and a third of the cervical spine. After 5 days of neostigmine therapy, there was striking relief from pain, increase in range of motion, and increased strength in all of these cases.

E. Phantom Leg Pain.

Case 17.—W., male, age 30. The patient had had an amputation through the upper third of the right thigh 3 months before. Since the operation, he complained of continuous severe pain in the right ankle ("like a vise clamping the ankle"). He required a great deal of sedation and was routinely awakened at

[4] These patients were treated at the U. S. Marine Hospital, Baltimore, Md., through the cooperation of Surgeon (R) Robert T. Henkle.

night by the pain in spite of the sedative. At 10 o'clock one morning he was given the first dose of neostigmine, and by 3 p. m. he noted marked relief from the phantom leg pain. During 6 days of treatment, he was free from pain and required no sedation. He was seen 6 weeks after neostigmine therapy was discontinued and had remained free from pain.

F. Miscellaneous Traumatic Cases.

Case 18.—K., male, age 18. The chief complaint was severe pain and tenderness in the left posterior calf, of 4 months' duration, resulting from direct trauma. Neostigmine therapy failed to relieve the pain and tenderness, but 6 days of treatment resulted in an increase of 20° in range of ankle dorsiflexion and enabled the patient to walk on his toes for the first time since the injury.

Case 19.—L., male, age 27. The patient had pain and limitation of motion of the left hip of 3 weeks' duration, related to severe exertion and muscle strain. He walked with a decided limp. Pain disappeared after 3 days of neostigmine therapy. After 8 days of treatment, he was free from pain and walked with only a slight limp. Range of left straight leg raising had increased 30°; right straight leg raising had increased 35°. Pain and limitation of motion on external rotation at the left hip had disappeared. Range of left hip flexion with the knee flexed had increased 35°.

II. Neostigmine Therapy of Hemiplegia, Facial Paralysis and Cerebral Palsy

The persistent disability in hemiplegia is based on muscular spasticity, which resists and limits passive motion, on various degrees of paresis, and in some cases on muscular pain. Since these types of neuromuscular dysfunction in poliomyelitis (*1*), chronic rheumatoid arthritis (*2*), and in disability following trauma have been observed to respond to neostigmine therapy, it was considered worth while to explore the possibilities of neostigmine therapy in hemiplegia and in the spastic type of cerebral palsy. Ward and Kennard (*3*) have reported that recovery of function following ablation of the motor cortex in monkeys is accelerated by administration of a cholinergic drug, doryl. The therapeutic action of doryl in experimental hemiplegia was not affected by atropine. Kremer (*4*) investigated the central action of neostigmine in man by intrathecal administration of the drug to 37 patients with evidence of pyramidal tract involvement. In all cases, neostigmine produced a striking depression of tonus of skeletal muscle and of deep reflexes by direct action on the spinal cord. Strength of voluntary motion was also depressed by the drug. Kremer made no attempt to apply these observations to therapy. Wolf (*5*) has reported a case of chronic facial paralysis that showed improvement from neostigmine administration.

RESULTS

A. Hemiplegia.—Seven patients with hemiplegia have been treated with neostigmine and atropine administered subcutaneously once or twice daily. The drug was found to depress muscle tonus and thereby relieve spasticity, increase range of passive motion and decrease deformity. There was also relief from muscle pain and definite in-

crease in power of voluntary motion. Improvement was evident in some cases within 24 hours after initiation of neostigmine therapy.

Case 20.—L., male, age 34. Right hemiplegia, ptosis, lower facial paralysis, dysarthria, and lingual paresis had developed suddenly 5 months before. The patient suffered from chronic hypertension and hypertensive encephalopathy. There had been no apparent improvement in the neurological condition for several months.

(*a*) *Cranial nerves.*—Before neostigmine treatment, there was paralysis of the right side of the face below the brow. Ptosis was present and the right corner of the mouth was drawn down and did not move in attempting to show the teeth. He had considerable dysarthria, difficulty in moving food from one side of the mouth to the other, and was unable to suck fluids through a tube. He stated that his tongue felt thick as though it filled his mouth, and he had trouble controlling it.

Subcutaneous injections of neostigmine methylsulfate, 1 cc. of 1: 2,000 solution, and atropine sulfate, gr. 1/150, were administered twice daily. After 1 week of treatment the facial paralysis had greatly improved. There was no ptosis, and eyelid movements were stronger. The right corner of the mouth was not drawn down. In attempting to show his teeth, the right corner of the mouth moved almost as well as the left. The difficulty in moving food about in the mouth was no longer observed. He was able to suck fluids through a tube with ease. Speech was markedly improved: enunciation was clear and he was able to speak more rapidly. The feeling of thickness of the tongue had disappeared. After 3 weeks of neostigmine therapy, the only sign of facial paralysis was a slight weakness in moving the right corner of the mouth when showing the teeth. The eyelids, tongue, and speech were normal.

(*b*) *Range of passive motion.*—At 5 months after the onset of the spastic paralysis, there was marked limitation in range of passive motion (table 1). At the wrist, there was limitation of passive extension and ulnar deviation. The hand showed a flexion deformity and it was impossible passively to straighten the fingers or extend them at the metacarpophalangeal joints. At the hip, there was considerable limitation of internal and external rotation.

The increase in range of passive motion brought about by neostigmine is evident in table 1. Measurements of angle of limitation of motion were made with a goniometer. Some improvement was apparent in 24 hours and most of the improvement occurred in the first week of drug therapy. The increase in range of motion was usually 15° to 20°.

TABLE 1.—*Case 20. Hemiplegia of 5 months' duration. Angle of limitation o motion (in degrees)*

			Neostigmine therapy: Before	1 day	1 week	2 weeks	3 weeks
Shoulder	Abduction	Passive	[1] 75	90	95	90	90
		Active	40		55	65	60
	Forward flexion	Passive	105		115	110	110
		Active	30		45	45	50
	Extension	Passive	65		75	70	80
		Active	30		45	50	45
Elbow	Flexion	Passive	60	45	40	45	45
Knee	Extension	Passive	160		170	180	180
Ankle	Dorsiflexion	Passive	120		110	100	93
Bending forward, knees straight			[2] 12		[2] 8	[2] 6	[2] 7

[1] Single reading. No significance is attached to changes of less than 10°
[2] Distance of fingertips from floor in inches.

Within 24 hours, there was definite improvement in the flexion deformity of the fingers. The hand was warmer and felt "less clammy" to the patient. After 1 week, the limitation of passive motion at the wrist and in rotation at the hip was no longer present. After 2 weeks, the flexion deformity of the fingers practically disappeared.

(c) *Active motion.*—One of the striking changes observed following neostigmine therapy was the increased power of voluntary contraction of the muscles. This patient, in attempting to touch his forehead, was able to reach only to 15 inches from his head. He was also incapable of actively touching the opposite shoulder. The first injection of neostigmine was given one evening, and the next morning the patient could actively touch the forehead and opposite shoulder for the first time. The increase in strength was also evident from the angle of limitation of active motion (table 1).

Before drug treatment was initiated, the patient was unable to stand up or walk without support. He was able to walk with great difficulty with a cane in the right hand if he supported himself against the wall with his left hand and pulled himself along. After 1 week of neostigmine therapy, he was able to walk well with a cane, his gait was stronger and more stable, and the limp was less marked. At 2 weeks, his gait was greatly improved and the ankle clonus which had occurred at each step was no longer present. At 3 weeks, he was able to walk at least 100 feet without the cane and with only a slight limp and had walked up stairs and on rough ground without difficulty, using the cane.

There was a definite improvement in strength and coordination of all the affected muscles; this was evident to the patient and readily demonstrable objectively. Before treatment, the grip was very weak and finger coordination very poor. The patient was unable to stand on the toes or heel of the right foot. He was able to turn the shoulder wheel only about one-third of one turn. He had great difficulty in balancing himself on the stationary bicycle, his right foot came off the pedal at almost every turn and he was able to try it only for 1 or 2 minutes. After 1 week of neostigmine therapy, there was increase in strength and better coordination. The grip was definitely more powerful. The patient was now able to walk on the toes but not on the heel of the right foot. After 2 weeks of drug treatment, there was further improvement in strength of grip, and better coordination and greater rapidity in rhythmic movements of the fingers. He rode the stationary bicycle without difficulty for 15 minutes and made 2 consecutive turns on the shoulder wheel. He could stand up straight and bend forward with the knees straight and the arms extended without support and with good balance. After 3 weeks of neostigmine therapy, the patient was able to turn the shoulder wheel at least 24 times, and had greater strength, coordination, and endurance on the stationary bicycle. There was progressive increase in strength and better coordination in both the right arm and leg.

(d) *Reflexes.*—The biceps, triceps, knee, and ankle jerks were markedly hyperactive on the right side. The Hoffman reflex was positive but the Babinski, Chaddock, Gordon, and Oppenheim reflexes were negative on the right side. Sustained ankle clonus was readily elicited on the right. In walking, the right foot showed clonus at each step.

During neostigmine therapy, there was no apparent change in these reflexes except for the ankle clonus. At 2 weeks after beginning the drug treatment, it was noted that the right ankle clonus was no longer present in walking. In the supine position, it was definitely more difficult to elicit ankle clonus than it had been previously, but the clonus was still sustained.

(e) *General condition.*—This patient had had hypertension for a long time and suffered from headaches and dizziness. He was markedly undernourished and

weighed only 107 pounds. His appetite was poor. His usual blood pressure was 220/150.

During the period of neostigmine therapy, no untoward reactions were noted from administration of the drugs. His blood pressure was measured frequently and did not rise above 220/150. At 3 weeks after initiation of therapy, blood pressure was 200/150. There had been no increase in the symptoms of hypertensive encephalopathy. His appetite was still poor and he weighed 106 pounds.

During 2½ months after cessation of drug therapy, the improvement in passive and active motion had been retained.

Case 21.—S., male, age 56. Patient had a right hemiplegia of 17 years' duration. There had been no change in his condition for many years.

The right foot showed a marked equinus deformity, with the heel 2½ inches from the floor. There was a slight flexion deformity of the knee, tilted pelvis, scoliosis, and kyphosis. There was an extreme flexion deformity of the right hand and wrist.

After 1 week of neostigmine therapy, the equinus had disappeared and the patient was able to stand up much straighter with both heels on the floor. The flexion deformity of the knee was no longer present and there was considerable improvement in the flexion deformity of the hand and wrist.

After 1 month of treatment, he could stand up straight with both heels on the ground, both knees straight, and only slight kyphosis. The fingers could be fully extended but there was moderate flexion at the metacarpophalangeal joints. The flexion deformity at the wrist was greatly improved.

The patient was able, for the first time in many years, to carry out the following motions 24 hours after beginning neostigmine therapy: touch top of head, opposite shoulder, opposite buttock, mouth, and chin, put cigarette in mouth, abduct the hip, and elevate the scapula. At this time, there was a striking decrease in resistance to passive motions of the upper extremity and measurable increase in range of passive motion.

After 1 month of treatment, the range of passi shoulder abduction had increased 15°, forward flexion 15°, extension 15°. Rotation at the shoulder was no longer limited and resistance to passive motion at shoulder and elbow had disappeared. Range of passive supination increased 90°, wrist extension 40°, hip flexion 40°, knee extension 20°, and ankle dorsiflexion 45°. Whereas there had been complete limitation of external and internal rotation at the hip and inversion and eversion at the ankle before treatment, all of these passive motions could be carried out through the full normal range after 1 month of neostigmine therapy.

On the first examination, the right ankle jerk was difficult to elicit and ankle clonus was not obtained. After 1 week of treatment, with marked increase in range of motion at the ankle, the right ankle jerk was hyperactive and sustained ankle clonus was readily elicited.

Before treatment, if the patient held an object in the right hand he was unable to release it voluntarily, but had to remove it with the left hand. After 1 week of treatment he was able to release objects held in the right hand without difficulty.

There was a striking increase in strength of all motions at the shoulder and elbow, only slight improvement in strength of motions of wrist and fingers. In the lower extremity, there was marked increase in strength of hip flexion, extension and abduction, and of plantar flexion at the ankle. After 1 month of treatment, he had no power in the interossei of the right hand, no active motion in hip rotation, and ankle dorsiflexion, inversion, and eversion. The gait was definitely improved.

Case 22.[5]—R., male, age 68. Right hemiplegia of 4½ months' duration due to cerebral thrombosis showed very little improvement from routine therapy. The patient was given daily injections of placeboes (saline) for 5 days with no subjective or objective improvement. On the day following the first injection of neostigmine, the patient reported spontaneously that he was stronger, had less pain, and could move more easily. On the third day of neostigmine therapy, there was increased range of passive motion, a definite increase in strength, less pain in the spastic arm and leg, and improved strength and coordination of tongue and eyelids. Further rapid improvement in strength, range of motion and gait, and relief from pain were observed during 1 month of neostigmine therapy.

Case 23.—This patient had a hemiplegia of 3 months' duration that developed shortly after a series of head injuries. After 1 week of neostigmine therapy, there was striking improvement of dysarthria and facial paralysis, increased range of and decreased resistance to passive motion, and striking increase in strength. He reported that there was definite improvement in the hemihypesthesia. At 1 month following cessation of treatment, the improvement had been retained.

Case 24.—Another patient[6] with hemiplegia of 1½ years' duration had precordial pain at night from pressure on the chest caused by the spastic arm. Neostigmine rapidly relieved these symptoms and caused increased range of motion of the upper extremity and significant improvement ih gait.

Cases 25 and 26.—Definite and rapid improvement in range of motion and strength has been observed in two other patients with hemiplegia.

B. Monoplegia.

Case 27.—M., male, age 56. This patient had a monoplegia of the left upper extremity of obscure etiology, which had been present for 21 months. Before treatment, all motions of the left arm could only be carried out against slight or moderate resistance. He could bend forward to reach 10 inches from the floor. After 2 days of neostigmine therapy, all motions of the left upper extremity could be carried out against strong resistance, and were just perceptibly weaker than the right. Muscle pain had disappeared. The patient could bend forward to reach to 3 inches from the floor. After 9 days of treatment, the left arm was equal in strength to the right.

Case 28.—This patient with a monoplegia and facial paralysis of 3 weeks' duration due to neurosyphilis showed no response to saline injections but showed a striking increase in strength in the monoplegic arm after 3 days of neostigmine therapy. There was no improvement in the facial paralysis.

C. Facial Paralysis, Dysphonia, Dysarthria and Dysphagia.

Case 29.—P., female, age 42. This patient had a right facial paralysis of lower motor neuron type and a dysphonia of 10 years' duration. The disability was caused by a head injury with basal skull fracture.

Before treatment the right side of the face had a stiff, boardlike quality. There was no motion of raising the right eyebrow, of frowning, or of the right ala nasi. Eye closure was very weak and the right eye could not be closed completely. The right corner of the mouth was drawn down and there was very little motion in smiling. If the patient rinsed her mouth, fluid streamed out through the right corner of the mouth.

The voice was always hoarse and the patient stated that it required a "strenuous effort in the throat" in order to speak. The voice fatigued very easily and frequently would crack, or no sound was emitted at all despite intense effort.

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[5] This patient was treated at the U. S. Marine Hospital, Stapleton, S. I., N Y., through the cooperation of Passed Assistant Surgeon (R) Henry I. Russek.

[6] This patient was treated at the U. S. Public Health Service Dispensary, Washington, D. C., through the cooperation of Passed Assistant Surgeon (R) R. M Thomas.

Four days after initiating neostigmine therapy, the right side of the face lost its boardlike quality and became softer and more mobile. The mouth was straighter in repose and the patient was able to pucker the lips and hold fluid in the mouth for the first time. The dysphonia was greatly improved.

After 3 weeks of treatment, she was able to frown and elevate the eyebrow slightly. The right eye could be closed completely and with increased strength. The right ala nasi now moved slightly and the nasolabial sulcus was much deeper, giving the face a more symmetrical appearance. In repose, the mouth was straight. She could pucker the lips more strongly and had no difficulty in holding fluid in the mouth or in drinking pop from a bottle. There was definite improvement in motion of the right side of the mouth in smiling and showing the teeth. The stiffness of the right side of the face was no longer present. The dysphonia had practically disappeared. The hoarseness was almost gone, there was no fatigue, and speech required no effort. She no longer noticed cracking or loss of the voice.

During 3 months following cessation of neostigmine therapy, the improvement had been retained.

Case 30.—M., female, age 46. Left Bell's palsy was of 3½ years' duration. Neostigmine therapy for several weeks resulted in slight but definite increase in motion of the left side of the nose and cheek.

Case 31.—S., male, age 45. Bilateral lower motor neuron facial paralysis, dysarthria, and dysphagia had developed following heat exhaustion and had been present for 5 weeks. The dysarthria was severe and no words could be understood. The tongue could not be protruded or moved from side to side, and there was no motion of the soft palate.

After 1 day of neostigmine therapy, there was striking improvement in the dysphagia. After 2 days, he was able to say a number of words fairly clearly and had more motion of the soft palate and tongue.

After 8 days of neostigmine therapy, the patient's speech was greatly improved. He could say almost any word clearly and was using phrases and short sentences, although he still had to speak slowly. The voice was louder and the nasal tone less marked. The dysphagia had disappeared. He was able to protrude the tongue and move food about the mouth without difficulty. The bilateral facial paralysis showed no significant improvement.

D. CEREBRAL PALSY.—Because of the similarity of the disability in the spastic type of cerebral palsy to hemiplegia, it was of interest to determine the action of neostigmine in cases of cerebral palsy. Five cases of cerebral palsy have been treated with neostigmine through the cooperation of three physicians.[7] Definite improvement of spasticity and some improvement in strength and coordination has been observed in these cases.

Case 32.—A 9-year-old male with severe contractures from congenital cerebral palsy, under the care of Dr. Lloyd. It was impossible to separate the legs because of adductor contractures, the knees were in maximal flexion, the arms and hands in extreme flexion, and the back in hyperextension with opisthotonos. The boy had never been able to lie flat on his back. After several weeks of neostigmine therapy, the adductors relaxed and the knees could be separated a distance of about 12 inches. There was relaxation of the hamstrings and increased range of knee extension of about 70°. The opisthotonos disappeared and the hyper-

[7] The author wishes to thank these physicians for their cooperation. Two cases of cerebral palsy were under the care of George Boines, M. D., of Wilmington, Del., 2 cases under the care of Philip Trommer, M. D., of Philadelphia, Pa., and 1 case under the care of Allen Lloyd, M. D., of Washington, D. C.

extension of the spine improved so that the patient was able for the first time to lie on his back. There was no significant improvement in the upper extremities.

Case 33.—A 2½-year-old female with hemiplegia of congenital origin under the care of Dr. Boines. The child had a flexion deformity of the left hand and did not use the left arm at all. She had great difficulty in learning to walk because of the spastic left leg. After 1 month of neostigmine therapy there was striking improvement in the flexion deformity and the child was using the left arm a great deal, and had almost normal use of the arm. There was a definite improvement in gait. The case has been followed for 1 year and the improvement was retained after neostigmine was discontinued.

III. Neostigmine Therapy of Chronic Rheumatoid Arthritis and Subacromial Bursitis

In many cases of chronic rheumatoid arthritis, neuromuscular dysfunction plays a major role in the disability. Muscle spasm and contracture and muscle pain apparently restrict motion at the joints and cause deformity long after the joint inflammation has subsided and the need for splinting of the inflamed joint has passed. In addition, muscular atrophy and weakness are of importance in increasing the disability. Similar types of neuromuscular dysfunction prolong and intensify the disability in chronic subacromial bursitis.

Neostigmine has been found useful in the inhibition of muscle spasm and in the relief of muscular pain as well as in increasing strength of voluntary motion in poliomyelitis (*1*). Relief of muscle spasm by neostigmine has been reported in chronic rheumatoid arthritis (*2*).

RESULTS

A. Chronic Rheumatoid Arthritis.—Six patients with chronic rheumatoid arthritis, three patients with chronic spondylitis, and one patient with chronic arthritis of the hip of unknown etiology, were treated with neostigmine. All of these patients had suffered from the disease for many years, had severe disability and no longer had acute inflammation of the joints. The condition had been stable for a long period of time and no recent progress had been observed from various types of therapy.

Case 37.—M., female, age 66. Rheumatoid arthritis was of 13 years' duration. This patient had ankylosis of the right knee in extension. There was limitation of ankle and hip motion, flexion of the spine, flexion deformity of the hands, and limitation of abduction in the right shoulder at 90°. She was very unstable and was unable to stand up or walk without a cane for support. There had been no improvement for a number of years.

After 1 week of neostigmine therapy, the limitation of shoulder motion had disappeared. After 2 weeks of treatment, she was able to stand up straighter and walk without support. After 1 month of treatment, the patient was free from pain, could stand up straight, and walk without support. There was a definite increase in strength and decreased fatigue. She was able to bend forward and reach almost to the floor with good stability and without support.

There was increased range of motion at ankle, hip, and shoulder, and improvement in the fingers. There was no change in the ankylosed knee joint.

The patient has been followed for 6 months since neostigmine therapy was discontinued and has retained the improvement.

Case 38.[8]—This elderly woman had rheumatoid arthritis for many years and had been confined to bed and wheel chair for 6 years. She suffered from severe joint and muscle pain, marked limitation of motion, and deformities. She was given placeboes for 1 week with no response. Then neostigmine was given and in a few days there was striking relief from pain and increase in range of motion at many joints. After 2 weeks of neostigmine therapy, the patient was able to stand up and walk for the first time in 6 years.

Case 39.[8]—This man was severely deformed by chronic rheumatoid arthritis, with ankylosis of the cervical spine in extreme flexion. He had been confined to bed for 16 years. Within 1 week after initiation of neostigmine therapy, there was a significant increase in range of motion at both shoulders and the patient had the strength, for the first time, to raise his right arm and to touch the top of his head with the left hand.

Case 40.—This middle-aged female with chronic rheumatoid arthritis suffered from muscular and joint pains, muscular cramps, weakness, and fatigue. All of these symptoms were strikingly improved in a few days from neostigmine therapy. The improvement was retained for several months after treatment was discontinued.

Case 41.—E., male, age 42. Arthritis of right hip of unknown etiology had been present for 27 years. Vitallium cup had been placed on head of femur 2 years before. He had limitation of motion at the right hip and knee and could reach only to 10 inches from the top of his right shoe. When he walked one-third or one-half of a block, he had to stop because of severe pain from spasm of the right biceps femoris muscle.

After the first neostigmine treatment, he was able to walk 15 blocks without spasm of the biceps femoris. After 1 week of neostigmine therapy, he was able to reach the top of his right shoe. There was increased range of motion of the right knee and hip and less pain. He was practically free from spasm of the biceps femoris. There was a definite increase in strength and decreased fatigue.

Case 42.—This middle-aged man had had rheumatoid arthritis for 9 years with marked limitation of motion, weakness, and atrophy. Neostigmine therapy resulted in slight increase in range of motion and strength in the upper extremities but there was little significant improvement.

Case 43.—This man had severe flexion deformities of the hands from chronic rheumatoid arthritis. There was definite improvement of this disability from 1 month of neostigmine therapy.

Case 44.—N., female, age 35. Spondylitis had been present for 11 years with bony ankylosis of lumbar and thoracic spine. Patient had very marked limitation of all motions of the head. Weakness and fatigue of arms and legs were marked and pain required aspirin many times a day. She had not suffered from acute arthritis for 1½ years.

After the first neostigmine treatment, patient noted disappearance of pain and fatigue, and more free and normal use of the extremities. After 1 month of therapy, there was a definite increase in range of rotation, flexion, and extension of the cervical spine. The patient was able, for the first time in 5 years, to cut her own toenails and stand up and see her shoes. She was free from pain and no longer required aspirin. There was a striking increase in strength and decreased fatigue. Posture and gait definitely improved.

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[8] These patients were treated at the U. S. Marine Hospital, Baltimore, Md., through the cooperation of Passed Assistant Surgeon (R) C. W. Jones.

Cases 45 and 46.—Two middle-aged males had had spondylitis with ankylosis of lumbar and thoracic vertebrae for many years. Neostigmine therapy resulted in relief from pain and muscle spasm, increased range of motion of the head, and decreased fatigue

B. ACUTE RHEUMATOID ARTHRITIS.—Two patients with acute rheumatoid arthritis were given a trial of neostigmine therapy. No beneficial effects were noted.

C. SUBACROMIAL BURSITIS.—In two patients with chronic subacromial bursitis, no improvement was observed during neostigmine therapy. On the other hand, in three other patients with this disease, definite improvement was noted following a short course of neostigmine treatment. Complete disappearance of the disability was not observed in any of these cases.

Case 49.—S., male, age 39 Left subacromial bursitis began 8 months before, following immunization Severe pain in shoulder, weakness of arm, and limitation of motion of the shoulder were observed. No significant improvement was noted from 2 weeks of neostigmine therapy.

The other patient with subacromial bursitis who did not respond to neostigmine was an elderly woman who had had the disability for many months.

Three patients, all males, showed relief from pain, increased range of motion, and increased strength from neostigmine therapy. One patient had subacromial bursitis for 1 month, another for 5 months, and the third patient for 4 months.

Case 53. - F , male, age 35 Right subacromial bursitis of 4 months' duration. Acute pain in the region of the bursa had disappeared in a few days but limitation of motion and muscular pain on activity persisted.

Within 24 hours after initiation of neostigmine therapy, there was definite increase in range of passive forward flexion and external rotation, and decrease in muscular pain. After 1 week of treatment there was significant improvement in range of motion at the shoulder—forward flexion increased 25°, extension 20°. He was able to use the arm more normally without pain. After 1 month of therapy, there was no further improvement, and considerable disability persisted.

DISCUSSION

The purpose of this investigation was to study, in a preliminary way, the efficacy of neostigmine therapy in a variety of types of chronic neuromuscular dysfunction. Observation of 53 patients under this treatment has revealed that improvement in range of motion, relief from pain, and increase in strength and endurance may occur rapidly in cases of disability following trauma, of hemiplegia and related neurological conditions, and of chronic rheumatoid arthritis and subacromial bursitis. Most of these patients suffered from severe neuromuscular dysfunction for a long period of time, did not have spontaneous remissions, and had failed to improve with other types of therapy.

The results have been encouraging enough to warrant further investigation, and an evaluation of neostigmine therapy is now in progress. Control procedures are being utilized to evaluate possible psychogenic factors. Cases suitable for this treatment must be se-

lected with care, since the drug can only be expected to cause improvement in certain types of neuromuscular dysfunction.

Disability resulting primarily from muscle spasm or hypertonus, muscular pain, and certain types of paresis frequently appears to respond to neostigmine therapy. Many patients with chronic disability following trauma or resulting from arthritis or neurological disorders have other conditions, such as bony or fibrous ankylosis, active inflammation, and loss of innervation, as primary causes of their disability, and these cannot be expected to benefit from neostigmine therapy.

No conclusions should be drawn from this preliminary investigation about the percentage of cases of various types of disability which will respond to neostigmine. Further study is needed to establish this point.

The mechanism of action of neostigmine in relaxation of muscle spasm or contraccure, in relief of muscle, joint, or nerve pain, and in increasing the power of voluntary contraction of paretic muscles in a variety of pathological conditions, is not established. The inhibitory action of neostigmine on cholinesterase at the synapses in the central nervous system as well as at the myoneural junction may be of importance. Since the action of neostigmine on the central nervous system in man is inhibition of muscle tonus and deep reflexes (*4*), it appears likely that the relaxation of muscle spasm which was observed in this investigation is a manifestation of the central action of the drug. Such a central inhibitory action on muscular hypertonus is apparently effective, regardless of whether the hypertonus is of peripheral origin, as in cases of trauma, arthritis, etc., or of central origin, as in poliomyelitis (*1*, *6*) and hemiplegia.

Recovery of function following cerebral infarction is usually attributed to formation of new pathways and the taking over by other areas of the brain of the functions of the region destroyed. Cholinergic facilitation at synapses may conceivably accelerate the formation of new pathways in the central nervous system.

In cases of cerebral infarction, one may predict that the possibilities of neostigmine therapy will be distinctly limited. The drug can only improve function within the limits imposed by the irreversible brain damage and the possibilities for formation of new neural pathways to the abnormally functioning motor units. Since the localization and extent of the lesion will vary from case to case, one should expect differences in the efficacy of the drug therapy in different cases of cerebral infarction. It is worthy of note that, in one case (case 31), dysphagia and dysarthria showed improvement without corresponding improvement in the facial paralysis. The most that one can hope for is that neostigmine therapy may perhaps result in full and efficient

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utilization of the remaining central nervous tissue and thereby make it possible to bring about maximal functional recovery.

It is worthy of note that neuromuscular dysfunction appears to play a more important role in many chronic disabilities than has been generally realized. Neuromuscular dysfunction is frequently a major factor in the disability in chronic rheumatoid arthritis and following various types of trauma, as well as in spastic paralysis of neurological origin. Muscle spasm, which may be a necessary and beneficial means of splinting a joint following acute injury and inflammation, may, in the chronic stage, itself become the major factor in disability by restricting joint motion and causing pain. More intensive investigation of the mechanisms involved in chronic disabilities is indicated.

The fact that doryl has been found to be effective in accelerating recovery of function in hemiplegic monkeys (*3*) and that neostigmine appears to produce similar effects in hemiplegia in man suggests the possibility that a variety of cholinergic drugs may eventually be found useful in the treatment of neuromuscular dysfunction.

SUMMARY

Neostigmine therapy has been applied to 53 selected patients suffering from chronic neuromuscular dysfunction. The results of this preliminary study have been encouraging.

Neostigmine therapy may be followed by increased range of passive motion, increased voluntary power, and relief from pain in selected chronic cases of disability following trauma, of hemiplegia and related conditions, and of rheumatoid arthritis and subacromial bursitis.

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DEATHS DURING WEEK ENDED NOVEMBER 25, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 25, 1944	Corresponding week, 1943
large cities of the United States		
ths	8,477	8,763
Average for 3 prior years	8,648	
Total deaths, first 47 weeks of year	421,420	428,828
Deaths under 1 year of age	566	616
Average for 3 prior years	606	
Deaths under 1 year of age, first 47 weeks of year	29,104	30,963
Data from industrial insurance companies		
Policies in force	66,911,354	66,063,813
Number of death claims	11,202	9,571
Death claims per 1,000 policies in force, annual rate	8.8	7.6
Death claims per 1,000 policies, first 47 weeks of year, annual rate	10.0	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

Summary

The incidence of meningococcus meningitis, although fluctuating from week to week, continues high, and presages a second successive year of epidemic proportions. The geographic distribution has been more general than that of poliomyelitis. To date a total of 15,298 cases has been reported, as compared with 16,530 for the same period last year and a 5-year (1939-43) median of 1,880 cases for the corresponding period. For the current week 172 cases were reported as compared with 141 cases for the preceding week and a 5-year median of 53 cases. The monthly death rate (annual basis) for meningitis this year, as computed by the Bureau of the Census on a 10-percent sampling of death certificates, has gradually declined from 4.2 per 100,000 population in January to 0.6 in August.

The seasonal decline in poliomyelitis continues, with 174 cases for the current week as compared with 221 last week and a 5-year median of 116 cases. A total of 18,885 cases has been reported to date, as compared with 12,134 for the same period last year and a median of 8,805 for the corresponding period. About 76 percent of the cases this year occurred in the Middle and South Atlantic and the East North Central States.

The figures for most of the other important communicable diseases reported weekly by the State health officers are below or close to the median expectancy, with the exception of the dysenteries and endemic, or murine, typhus fever. A total of 4,885 cases of endemic typhus fever has been reported to date as compared with 4,187 for the same period last year. The current incidence of influenza (2,200 cases) is about half that reported last year (4,489) and less than the 5-year median for the week (2,756).

A total of 9,406 deaths was reported during the week in 93 large cities in the United States, as compared with 8,477 last week and a 3-year average of 9,462.

Telegraphic morbidity reports from State health officers for the week ended December 2, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report while leaders imply that although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939-43	Week ended—		Median 1939-43	Week ended		Median 1939-43	Week ended—		Median 1939-43
	Dec. 2, 1944	Dec. 4, 1943		Dec. 2, 1944	Dec. 4, 1943		Dec. 2, 1944	Dec. 4, 1943		Dec. 2, 1944	Dec. 4, 1943	
NEW ENGLAND												
Maine	0	1	0		1	1	14	132	12[illegible]	1	3	0
New Hampshire	0	0	0				12	0	3	1	0	0
Vermont	0	0	0				0	0	19	0	0	0
Massachusetts	9	5	4				75	258	226	9	13	2
Rhode Island	0	0	1	27	1		0	66	20	1	5	0
Connecticut	0	0	0	1	52	3	11	9	33	6	12	1
MIDDLE ATLANTIC												
New York	12	10	14	[1] 1	[1] 14	[1] 4	83	352	352	21	31	12
New Jersey	10	1	5	1	17	14	18	366	31	9	10	3
Pennsylvania	18	8	12	2	5		3[illegible]	242	289	11	33	5
EAST NORTH CENTRAL												
Ohio	12	17	21	7	1	13	16	417	45	3	9	1
Indiana	16	11	16	16	59	16	11	157	21	2	2	1
Illinois	6	7	30	8	18	14	28	132	31	20	14	3
Michigan [2]	14	9	10	1	7	4	8	465	133	6	23	0
Wisconsin	0	0	0	11	37	17	20	326	128	2	4	1
WEST NORTH CENTRAL												
Minnesota	9	15	4	1	273	2	2	603	61	0	2	0
Iowa	1	2	4				10	70	24	0	4	1
Missouri	3	5	5	2	21	2	1	9	9	7	5	0
North Dakota	24	2	2	20	23	16	1	187	1	0	0	0
South Dakota	0	2	3				[illegible]	59	[illegible]	0	1	0
Nebraska	2	12	4	5	88		4	7	3	0	0	0
Kansas	1	9	9	4	31	5	[illegible]	17	21	1	2	0
SOUTH ATLANTIC												
Delaware	0	1	0				2	15	3	0	1	0
Maryland [2]	9	7	7	1	6		2	24	8	4	8	2
District of Columbia	0	0	0		4	1	1	13	4	2	2	1
Virginia	9	9	27	133	[illegible]51	184	6	386	20	2	8	2
West Virginia	4	[illegible]	7	71	1	7	5	228	4	1	4	1
North Carolina	33	20	37		1	3	8	99	99	5	3	1
South Carolina	5	7	11	297	453	378	1	28	12	2	2	1
Georgia	9	14	14	12	105	40	0	32	10	1	5	1
Florida	11	4	4		[illegible]	6	2	16	2	3	7	1
EAST SOUTH CENTRAL												
Kentucky	4	10	13	2	3	3	3	8	37	4	3	2
Tennessee	13	11	11	26	1[illegible]5	43	21	35	15	8	8	1
Alabama	18	11	23	56	270	97	3	109	31	5	3	1
Mississippi [2]	6	8	10							2	1	1
WEST SOUTH CENTRAL												
Arkansas	17	4	14	7[illegible]	184	73	3	30	12	0	1	0
Louisiana	20	10	10	30	35	5	4	1	1	3	1	1
Oklahoma	15	6	19	67	29	60	4	2	2	1	3	1
Texas	58	50	50	1 136	1 298	769	33	66	24	6	4	1
MOUNTAIN												
Montana	[illegible]	1	1	18	2	8	2	112	15	1	2	0
Idaho	0	0	1	1	2	1	1	8	9	0	0	0
Wyoming	0	0	0	10	2	4	2	1	8	0	0	0
Colorado	2	4	10	20	238	50	9	84	60	1	3	1
New Mexico	3	1	2		21	2	0	4	4		1	1
Arizona	1	4	4	83	313	143	4	11	11	2	0	0
Utah [2]	0	0	0	20	1	3	8	8	62	1	0	0
Nevada	0	1	0				0	4	0	0	0	0
PACIFIC												
Washington	13	1	2		6		38	39	39	4	4	0
Oregon	2	7	3	9	4	24	22	78	58	0	2	1
California	44	33	29	24	51	51	363	101	101	13	25	1
Total	439	347	461	2 200	4 489	2 756	910	5 434	3,717	172	274	53
48 weeks	12 580	12 643	14 346	356 312	102 897	165 468	599 273	572 427	487 003	15,298	16 530	1 880

[1] New York City only

[2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended December 2, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis: Week ended—Dec. 2, 1944	Poliomyelitis: Week ended—Dec. 4, 1943	Poliomyelitis: Median 1939–43	Scarlet fever: Week ended—Dec. 2, 1944	Scarlet fever: Week ended—Dec. 4, 1943	Scarlet fever: Median 1939–43	Smallpox: Week ended—Dec. 2, 1944	Smallpox: Week ended—Dec. 4, 1943	Smallpox: Median 1939–43	Typhoid and paratyphoid fever [3]: Week ended—Dec. 2, 1944	Typhoid and paratyphoid fever [3]: Week ended—Dec. 4, 1943	Typhoid and paratyphoid fever [3]: Median 1939–43
NEW ENGLAND												
Maine	0	0	0	31	23	12	0	0	0	1	1	0
New Hampshire	0	1	0	15	8	7	0	0	0	0	0	0
Vermont	0	1	0	17	0	2	0	0	0	0	1	0
Massachusetts	5	3	1	218	166	166	0	0	0	4	0	1
Rhode Island	0	0	0	13	6	6	0	0	0	0	1	0
Connecticut	1	4	0	50	45	37	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	66	11	11	290	298	230	0	0	0	6	10	10
New Jersey	10	1	2	104	81	101	0	0	0	2	0	1
Pennsylvania	9	4	4	287	200	196	0	0	0	6	4	[illegible]
EAST NORTH CENTRAL												
Ohio	[illegible]	4	4	301	320	240	0	0	0	1	3	4
Indiana	0	0	1	93	71	93	0	2	2	0	1	1
Illinois	4	9	6	215	176	217	0	1	1	1	3	3
Michigan [2]	7	5	4	146	139	153	0	2	2	3	4	2
Wisconsin	2	9	3	118	149	149	0	1	1	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	0	1	72	84	73	0	0	0	0	0	0
Iowa	4	1	1	48	71	65	0	0	0	0	0	1
Missouri	3	6	1	55	43	51	0	0	1	1	0	3
North Dakota	2	0	0	20	7	11	0	0	0	0	1	0
South Dakota	0	1	1	9	29	29	0	0	0	0	0	0
Nebraska	3	1	2	2	28	15	0	2	0	0	0	0
Kansas	1	2	2	78	128	76	0	1	1	0	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	10	1	17	0	0	0	0	0	0
Maryland [2]	2	0	0	66	58	71	0	0	0	1	1	4
District of Columbia	2	0	0	18	25	13	0	0	0	0	0	1
Virginia	4	0	1	76	49	74	0	0	0	2	1	4
West Virginia	1	0	1	91	77	60	0	0	0	3	0	1
North Carolina	2	0	0	90	132	108	0	0	0	2	0	1
South Carolina	1	0	0	10	11	12	0	1	0	1	0	0
Georgia	1	0	0	27	29	38	1	0	0	0	1	3
Florida	0	0	0	12	6	[illegible]	0	0	0	1	2	2
EAST SOUTH CENTRAL												
Kentucky	4	1	3	49	47	71	0	0	0	1	1	4
Tennessee	1	0	1	73	74	64	0	0	0	3	1	3
Alabama	1	1	1	30	17	39	0	0	0	0	1	1
Mississippi [2]	2	0	1	8	16	11	0	0	0	2	3	3
WEST SOUTH CENTRAL												
Arkansas	2	0	0	31	6	17	0	0	2	1	3	4
Louisiana	0	2	1	14	15	15	1	0	0	4	1	8
Oklahoma	0	4	0	28	10	22	0	0	0	1	1	4
Texas	7	6	4	82	52	4	0	3	0	6	2	7
MOUNTAIN												
Montana	1	0	0	20	28	20	0	0	0	1	0	0
Idaho	0	0	0	46	22	12	0	0	0	0	4	0
Wyoming	0	1	0	9	3	5	0	0	0	0	0	0
Colorado	0	3	1	76	25	25	0	1	0	4	1	1
New Mexico	0	1	1	18	10	11	0	0	0	0	1	2
Arizona	0	1	1	15	16	4	0	0	0	0	0	0
Utah [2]	1	12	3	13	45	26	0	0	0	0	7	1
Nevada	1	0	0	0	1	0	0	0	0	10	0	0
PACIFIC												
Washington	6	3	1	44	115	39	0	0	0	0	1	2
Oregon	2	14	1	17	52	17	0	0	0	1	1	1
California	9	29	15	317	227	153	0	0	0	5	3	3
Total	174	141	116	3 462	3 244	2 903	2	14	19	75	67	121
48 weeks	18 885	12 134	8 805	175 567	128 170	128 170	361	701	1 298	5 176	5 222	8 099

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: Massachusetts, 4; New York, 3; Michigan, 1; Louisiana, 1; Nevada, 1.

Telegraphic morbidity reports from State health officers for the week ended December 2, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended Dec. 2, 1944								
	Week ended—		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Dec. 2, 1944	Dec. 4, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	80	21	24	0	0	0	0	0	0	0	0	0
New Hampshire	4	2	5	0	0	0	0	0	0	0	0	0
Vermont	29	43	43	0	0	0	0	0	0	0	0	0
Massachusetts	114	138	207	0	0	8	0	1	0	0	0	0
Rhode Island	19	19	19	0	0	0	0	0	0	0	0	0
Connecticut	76	35	68	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	259	283	436	0	0	27	0	0	0	0	0	0
New Jersey	91	100	187	0	10	0	0	0	0	0	0	0
Pennsylvania	153	137	371	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	96	78	183	0	0	2	0	1	0	0	3	0
Indiana	17	35	34	0	0	0	1	0	0	0	1	0
Illinois	62	103	195	0	1	10	0	1	0	0	11	0
Michigan [3]	62	142	250	0	0	5	0	0	0	0	0	0
Wisconsin	92	117	141	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	31	72	69	0	3	0	1	0	0	0	0	0
Iowa	5	21	21	0	1	0	0	0	0	0	0	0
Missouri	17	16	16	0	0	0	3	0	0	0	0	0
North Dakota	10	2	19	0	0	0	0	0	0	0	0	0
South Dakota	0	7	7	0	0	0	0	0	0	0	0	0
Nebraska	2	9	6	0	0	0	0	0	0	0	0	0
Kansas	32	28	29	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	3	6	0	0	0	0	0	0	0	0	0
Maryland [2]	55	35	70	0	0	0	1	0	0	0	1	0
District of Columbia	4	4	13	0	0	0	0	0	0	0	0	0
Virginia	64	82	58	0	0		144	0	0	0	3	0
West Virginia	19	29	18	0	0	0	0	0	0	0	0	0
North Carolina	80	200	136	0	0	0	0	0	0	0	0	8
South Carolina	42	43	21	0	0	5	0	0	0	0	0	3
Georgia	13	16	16	0	0	1	0	0	0	0	0	12
Florida	5	11	9	0	6	0	0	0	0	0	0	7
EAST SOUTH CENTRAL												
Kentucky	5	79	79	0	0	0	0	0	0	0	13	0
Tennessee	7	59	42	0	0	0	3	0	0	0	2	7
Alabama	31	9	12	0	0	0	0	0	0	0	0	16
Mississippi [2]				0	0	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	28	9	15	0	0	6	0	0	0	0	0	0
Louisiana	0	11	6	0	0	1	0	0	0	0	0	5
Oklahoma	1	0	5	0	0	2	0	0	0	0	0	0
Texas	174	156	76	1	13	138	13	0	0	0	2	19
MOUNTAIN												
Montana	19	15	9	0	0	0	0	0	0	0	0	0
Idaho	3	8	5	0	0	0	0	0	0	0	0	0
Wyoming	13	4	4	0	0	0	0	0	0	0	0	0
Colorado	15	61	17	0	0	1	0	0	0	0	0	0
New Mexico	0	5	18	0	1	2	0	0	0	0	0	0
Arizona	11	31	9	0	0	0	24	4	0	0	0	0
Utah [2]	18	11	20	0	0	0	0	0	0	0	0	0
Nevada	0	5	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	14	48	48	0	0	0	0	0	0	0	0	0
Oregon	13	37	24	0	0	0	0	0	0	0	0	0
California	134	97	182	0	1	9	0	0	1	0	0	2
Total	2,022	2,476	3,525	1	36	517	190	8	1	0	36	80
Same Week 1943	2,476			0	25	575	101	14	1	0	11	123
Same Week 1942	3,525			2	20	111	81	8	0	0	17	64
48 Weeks 1944	88,610			40	1,721	22,858	8,491	606	32	453	542	4,885
48 Weeks 1943	169,180			62	1,971	16,377	7,186	647	28	433	735	4,187
48 Weeks 1942	165,897		[4] 165,897	75	1,137	11,642	6,260	540	43	[4] 451	806	[4] 2,727

[2] Period ended earlier than Saturday.

[4] 5-year median, 1939–43.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 25, 1944

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	1	0	0	0	1	0	2	0	4	0	0	2
New Hampshire												
Concord	0	0	0	0	0	0	0	0	2	0	0	0
Vermont												
Barre	0	0	0	0	0	0	0	0	0	0	0	0
Massachusetts												
Boston	0	0	0	0	63	3	12	1	73	0	0	20
Fall River	0	0	0	0	1	0	2	0	1	0	0	0
Springfield	0	0	0	0	1	0	0	0	7	0	0	9
Worcester	0	0	0	0	0	0	7	0	9	0	0	16
Rhode Island												
Providence	0	1	0	0	0	1	7	0	2	0	0	6
Connecticut												
Bridgeport	0	0	0	0	0	0	2	0	2	0	0	0
Hartford	0	0	0	0	3	1	2	0	[illegible]	0	0	2
New Haven	0	0	0	0	2	1	3	0	7	0	0	11
MIDDLE ATLANTIC												
New York												
Buffalo	0	0	0	0	0	0	4	1	2	0	0	0
New York	14	1	1	1	4	21	43	35	100	0	0	64
Rochester	0	0	0	0	26	0	3	2	2	0	0	17
Syracuse	0	0	0	0	0	0	1	1	7	0	0	10
New Jersey												
Camden	0	0	1	1	0	0	4	0	0	0	0	0
Newark	0	0	0	0	1	0	1	0	8	0	0	2
Trenton	1	0	1	0	0	0	1	1	2	0	0	0
Pennsylvania												
Philadelphia	2	0	0	2	2	3	12	4	57	0	0	25
Pittsburgh	0	0	0	1	0	0	18	1	18	0	0	4
Reading	2	0	0	0	0	0	1	0	3	0	0	0
EAST NORTH CENTRAL												
Ohio												
Cincinnati	2	0	0	1	0	3	2	0	40	0	0	7
Cleveland	1	0	2	1	0	3	8	1	29	0	0	17
Columbus	0	0	0	0	1	0	4	0	9	0	0	13
Indiana												
Fort Wayne	0	0	0	1	0	0	3	0	5	0	0	0
Indianapolis	6	0	0	1	2	2	2	1	13	0	0	5
South Bend	1	0	0	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	0	0	0	0	2	0	0	0	0	0
Illinois												
Chicago	1	0	0	1	9	7	25	1	69	0	0	19
Springfield	0	0	0	1	2	0	3	0	3	0	0	0
Michigan												
Detroit	8	0	0	2	0	1	16	3	61	0	0	16
Flint	0	0	0	0	0	0	3	0	2	0	0	0
Grand Rapids	0	0	0	0	2	0	0	0	6	0	0	0
Wisconsin												
Kenosha	0	0	0	0	1	0	0	0	2	0	0	12
Milwaukee	0	0	0	0	1	1	4	0	22	0	0	0
Racine	0	0	0	0	3	0	0	0	10	0	0	6
Superior	0	0	0	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	1	0	0	0	0	0	4	0	9	0	0	1
Minneapolis	4	0	0	0	2	0	7	5	8	0	0	10
St Paul	0	0	0	1	1	3	2	0	18	0	0	25
Missouri												
Kansas City	5	0	0	0	0	0	8	0	13	0	0	3
St Joseph	0	0	0	0	0	0	0	0	2	0	0	0
St Louis	0	0	1	1	0	0	11	0	5	0	0	4

See footnotes at end of table

City reports for week ended November 25, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota												
Fargo	0	0	0	0	1	0	1	0	3	0	0	1
Nebraska												
Omaha	0	0	0	0	8	0	6	0	[illegible]	0	0	3
Kansas												
Topeka	0	0	0	0	0	0	1	0	4	0	0	0
Wichita	0	0	0	0	0	0	4	0	11	0	0	2
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0	0	0	0	1	2	0	1	0	0	3
Maryland												
Baltimore	4	0	3	0	0	0	11	0	35	0	1	56
Cumberland	0	0	0	0	0	1	0	0	1	0	0	0
Frederick	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0	1	0	3	2	8	0	21	0	0	4
Virginia												
Lynchburg	0	0	0	0	0	0	1	1	0	0	0	0
Richmond	0	0	0	0	0	0	1	[illegible]	13	0	0	0
Roanoke	0	0	0	0	[illegible]	0	0	0	1	0	0	0
West Virginia												
Charleston	0	0	0	0	0	0	0	0	1	0	0	0
Wheeling	0	0	0	0	0	0	3	1	4	0	0	0
North Carolina												
Raleigh	0	0	0	0	0	0	0	0	1	0	0	10
Wilmington	2	0	0	0	[illegible]	[illegible]		0	9	0	0	0
Winston Salem	0	0	1	1	0	0	0	0	6	0	1	2
South Carolina												
Charleston	0	0	7	0	0	0	1	0	0	0	0	0
Georgia												
Atlanta	1	0	3	0	0	1	1	0	1	0	0	0
Brunswick	0	0	0	0	0	0	2	0	0	0	0	0
Savannah	0	0	6	3	0	[illegible]	1	0	[illegible]	0	0	0
Florida												
Tampa	3	0	0	[illegible]	0	0		0	1	0	2	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	[illegible]	0	1	[illegible]	4	1	14	0		0	1	8
Nashville	0	0	0	1	1	1	4	0	3	0	0	2
Alabama												
Birmingham	0	0	[illegible]	0	0	1	[illegible]	0		0	0	1
Mobile	1	0	0	0	0	0	1	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0	0	0	0	0	4	0	[illegible]	0	0	3
Louisiana												
New Orleans	3	0	3	2	0	0	[illegible]	0	4	0	0	0
Texas												
Dallas	4	0	0	0	0	0	1			0	0	0
Galveston	0	0	0	0	0	0	1	0	[illegible]	0	0	0
Houston	4	0	0	0	0	0	3	1	1	0	0	0
San Antonio	1	0	0	1	0	1	4	0	1	0	0	0
MOUNTAIN												
Montana												
Billings	0	0	0	0	0	0	0	0	0	0	0	2
Helena	0	0	0	0	0	0	0	0	1	0	0	0
Missoula	1	0	0	0	0	0	0	0	0	0	0	0
Idaho												
Boise	0	[illegible]	0	0	0	0	0	0	0	0	0	0
Colorado												
Denver	2	0	2	1	3	0	6	1	12	0	0	3
Pueblo	0	0	0	0	0	0	0	0	2	0	0	0
Utah												
Salt Lake City	0	0	0	0	1	0	8	0	3	0	0	0

See footnotes at end of table

City reports for week ended November 25, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington												
Seattle	0	0	0	0	3	0	4	1	6	0	0	0
Spokane	0	0	1	0	3	0	3	0	5	0	1	0
Tacoma	0	0	0	0	3	0	2	0	1	0	1	1
California												
Los Angeles	[illegible]	0	8	1	4	2	1	1	27	0	0	8
Sacramento	0	0	0	0	1	0	4	0	6	0	0	1
San Francisco	0	0	[illegible]	3	14	1	7	1	17	0	0	19
Total	85	2	48	30	177	64	35[illegible]	69	8[illegible]2	0	7	455
Corresponding week 1943	10[illegible]		253	27	1 062		344		806	0	13	586
Average, 1939-43	96		261	[1] 33	[2] 811		[1] 392		787	2	22	1 010

[1] 3-year average 1941-43
[2] 5-year median 1939-43

Dysentery amebic Cases Boston 2 Baltimore 1 Tampa 1 Los Angeles 1
Dysentery bacillary Cases Fall River 1 Worcester 1 Providence 2 New Haven 1 Buffalo 1 New York 1 Syracuse 3 Columbus 1 Detroit 6 Charleston S C 3 Los Angeles 4
Dysentery unspecified —Cases San Antonio 16
Typhus fever endemic —Cases Charleston S C 1 Atlanta 3 Savannah 3 Tampa 4 New Orleans 2 Houston 5 San Antonio 5

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population 1943 34,273,800)

	Diphtheria case rates	Encephalitis infectious case rates	Influenza		Measles case rates	Meningitis meningococcus case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2 [illegible]	2 6	0 0	0 0	186	15 7	96 7	2 6	282	0 0	0 0	173
Middle Atlantic	8 8	0 5	1 4	2 3	15	11 1	40 7	20 8	92	0 0	0 0	56
East North Central	11 6	0 0	1 2	4 9	13	10 3	43 8	3 6	159	0 0	0 0	38
West North Central	19 9	0 0	2 0	4 0	24	6 0	87 5	9 9	181	0 0	0 0	9
South Atlantic	16 3	0 0	34 3	6 5	[illegible]	11 4	62 1	6 5	163	0 0	6 5	123
East South Central	29 5	0 0	5 9	17 7	30	17 7	147 5	0 0	47	0 0	5 9	6[illegible]
West South Central	36 2	0 0	9 1	9 1	0	3 0	57 4	12 1	45	0 0	0 0	9
Mountain	25 0	0 0	16 6	8 3	33	0 0	99 8	8 3	150	0 0	0 0	42
Pacific	9 5	0 0	23 7	6 3	44	4 [illegible]	33 2	4 7	98	0 0	3 2	46
Total	13 0	0 3	7 3	4 6	27	9 8	54 3	10 5	132	0 0	1 1	69

PLAGUE INFECTION IN TACOMA, WASH.

Plague infection has been reported proved in a pool of 32 fleas from 6 rats, *R norvegicus*, taken November 15, 1944

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent) —Rats found in Honokaa, Hamakua District, Island of Hawaii, T H, have been proved positive for plague as follows Hamakua Mill area, 1 rat on October 20, 1944, R H F D District 2A, 1 rat on October 31, 1944; Kukuihaele area, 1 rat on November 6, 1944; Kapulena area, 1 rat on November 7, 1944; Paauilo area, 1 rat on November 8, 1944

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases Week ended November 11, 1944.- During the week ended November 11, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		20		77	232	14	32	50	30	485
Diphtheria	4	30	14	66	7	8	5	1		135
Dysentery										
Bacillary				14					2	16
Unspecified					1					1
German measles				40	3			4	7	54
Influenza		8			32	2			3	45
Measles		2		209	27	23	2	9	62	334
Meningitis, meningococcus					2					2
Mumps				31	57	5	1	22	2	118
Poliomyelitis					[1] 11	1		3		[1] 15
Scarlet fever		11	10	58	139	22	9	35	35	319
Tuberculosis (all forms)			4	47	26	17	8	10	16	128
Typhoid and paratyphoid fever				19		2		1		22
Undulant fever					4					4
Venereal diseases										
Gonorrhea		17	11	41	150	47	29	27	76	398
Syphilis	3	8	8	100	92	13	6	27	38	295
Other				1						1
Whooping cough		20		123	37	7	3	20	29	239

[1] Includes 4 cases, delayed reports

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Algeria.—For the period October 11–20, 1944, 16 cases of plague were reported in Algeria, including 12 cases reported in Algiers, 2 cases in Hussein Dey, and 2 cases in Maison Carree.

Palestine.—For the week ended November 11, 1944, 8 cases of plague were reported in Palestine. For the month of October 1944, 44 plague-infected rats were reported in Haifa including the port, 3 plague-infected rats in the town of Jaffa, and 1 plague-infected rat was reported in Tel-Aviv.

Senegal.—For the period November 1–10, 1944, 13 cases of plague with 9 deaths were reported in Senegal.

Typhus Fever

Guatemala.—For the month of October 1944, 109 cases of typhus fever with 15 deaths were reported in Guatemala. The Departments reporting the highest incidence of this disease are as follows: Alta Verapaz, 24 cases, 1 death; Chimaltenango, 21 cases; El Quiche, 16 cases, 1 death; Quezaltenango, 27 cases, 10 deaths.

Yellow Fever

Ivory Coast—Divo – On November 24, 1944, 1 fatal case of suspected yellow fever was reported in Divo, Ivory Coast.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world, (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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RELATIVE RESISTANCE OF *ESCHERICHIA COLI* AND *EBERTHELLA TYPHOSA* TO CHLORINE AND CHLORAMINES[1]

By ELSIE WATTIE, *Bacteriologist*, and C. T. BUTTERFIELD, *Principal Bacteriologist*, *United States Public Health Service*

In the course of studies on the influence of pH and temperature on the bactericidal properties of chlorine for coliforms and enteric pathogens (*1*), it was noted that the relative resistance, or susceptibility, of *Esch. coli* and *Eber. typhosa* appeared to shift as the pH of the suspending water was changed. This phenomenon has been investigated further by making additional observations at other hydrogen ion concentrations in the zone of the apparent shift in resistance and by repeating the tests with other bacterial strains. In addition, the study has been repeated, using chloramine as the disinfecting agent instead of free chlorine.

The methods used in carrying on these studies, such as the preparation of (1) chlorine-free, chlorine-demand-free water, (2) glassware, (3) stock chlorine solution, (4) bacterial suspensions, (5) the determination of residual chlorine and of hydrogen ion concentrations, and (6) test procedures have been described fully in the reference (*1*) given.

In the portion of the study in which chloramine was used as the killing agent, the required amount of a standard chloride solution to produce 0.3 p. p. m. of nitrogen as N, was added to the sterile chlorine-free, chlorine-demand-free water, mixed thoroughly, and distributed in 500-ml. portions to a series of sterile containers. At appropriate time intervals varying amounts of standardized chlorine solution were added to produce chlorine/nitrogen ratios of 0.0 to 1.0, 0.5 to 1.0, 1.0 to 1.0, 2.0 to 1.0, 3.0 to 1.0, 4.0 to 1.0, 5.0 to 1.0, and 6.0 to 1.0 p. p. m. "Appropriate time intervals" mean that additions of chlorine were

[1] From Water and Sanitation Investigations, East Third and Kilgour, Cincinnati 2, Ohio. Presented before the annual meeting of the Society of American Bacteriologists, May 5, 1944.

made at such intervals that no conflicts would occur in the times for subsequent examinations of the various test portions. Examinations were made at 1-, 3-, 5-, 10-, 20-, 40-, 60-, 90-, 120-, 150-, 180-, and 240-minute intervals, with tests stopped when previous results indicated that 100-percent kills had been obtained for at least 2 of the preceding test periods. Various periods of contact (from a few minutes to 68 hours) between the chlorine and nitrogen before the addition of the suspension of test organisms were tried out. A 1-hour contact period was found most satisfactory and was adopted as a standard for the results reported at this time. With free chlorine, 17 series of tests have been completed with *Esch. coli* and 16 with *Eber. typhosa*. With chloramine, 25 series of tests have been completed with *Esch. coli* and 26 with *Eber. typhosa*. In each series, tests were made at pH 6.5, 7.0, 7.8, 8.5, 9.5, and 10.5.

The results obtained are presented in table 1 for *Esch. coli* strains exposed to free chlorine, in table 2 for *Esch. coli* exposed to chloramine, in table 3 for *Eber. typhosa* exposed to free chlorine, and in table 4, for *Eber. typhosa* exposed to chloramine. Consideration of the significance of these results will be covered in the discussion which follows.

A visual presentation of the results in figures portraying the full scope of the three variables concerned, namely, (1) percentage of bacterial survival, (2) time of exposure, and (3) variations in concentration of killing agent, has not appeared possible without confusion. Consequently, in the figures shown the percentage of bacterial survival and the variations in concentration of killing agent have been contrasted with the time factor limited to one period only, the 5-minute period having been selected for this purpose, as it appeared to be representative of the observed phenomena. In reaching this decision to use the 5-minute exposure time, study charts were prepared for the 3-, 5-, 10- and 20-minute exposure periods at pH 7.0, 7.8, and 8.5. Careful study of the lines of these charts indicated very close agreement in the general trends of the curves for the four exposure periods. The three pH values used were selected because the "change-over" of sensitivity of *Esch. coli* and *Eber. typhosa* occurred within this range with free chlorine as the bactericidal agent.

In figures 1, 2, 3, 4, 5, and 6 are presented the data obtained on the relative survival of *Esch. coli* and *Eber. typhosa* when exposed to free chlorine and to chloramine in various concentrations at 20° to 25° C. for 5 minutes at pH 6.5, 7.0, 7.8, 8.5, 9.5, and 10.5, respectively. It should be noted that the residual chlorine scale for chloramine had to be increased greatly over that used for free chlorine, due to the pronounced delay in the killing rate with chloramine.

TABLE 1 — *Average survival of* Esch coli, *expressed in percent of initial number when exposed to free chlorine in various concentrations at pH 6 5, 7 0 7 8, 8 5, 9 8 and 10 7 when held at 20° to 25° C*

Number of strains	Number of tests	Average percentage surviving after exposure						Residual Cl_2 p p m	
		1 minute	3 minutes	5 minutes	10 minutes	20 minutes	60 minutes	0 minute	60 minutes
pH 6 5									
1	2	100 0			100 0	94 3	94 6	0 0	0 0
1	2	92 8	34 4	14 4	2 8	2	2	01	005
1	2	85 1	2 2	1	0	0	0	02	015
1	[illegible]	37 3	0	0	0	0	0	03	03
1	2	4 6	0	0	0	0	0	04	04
1	2	0	0	0	0	0	0	05	05
1	2	0	0	0	0	0	0	085	085
pH 7 0									
2	3	98 6					91 8	0 00	
2	4	29 1	16 2	19 4	[1] 18 0		19 4	02	0 01
2	4	16 1	8	8	[1] 6		8	03	02
1	2	0	0	0	[1] 0		0	04	03
2	3	0	0	0			0	05	04
2	3	0	0	0			0	07	06
2	2	0	0	0			0	10	10
pH 7 8									
2	2	100 0			96 1	98 4	97 8	0 00	0 00
2	2	97 3	58 0	53 0	50 0	41 1	40 0	02	02
2	2	63 1	41 0	37 3	32 4	35 7	27 3	04	04
2	2	0 2	1 0	0	0	0	0	08	07
2	2	12 4	0	0	0	0	0	10	09
2	2	1 4	0	0	0	0	0	15	14
pH 8 5									
1		100 0			94 6	92 4	95 4	0 00	0 00
1		90 0	64 1	29 6	1 2	2	0	05	05
1	[illegible]	87 0	5 9	2	0	0	0	07	07
1	8	29 5	1	1	0	0	0	14	14
pH 9 8									
1	4	100 0			97 0	91 9	69 0	0 00	0 00
1	1	83 2	99 1	76 1	81 4	56 2	5 8	02	02
1	3	93 4	88 5	70 7	56 8	44 7	9 5	04	04
1	2	80 0	67 6	33 5	2 0	0	0	06	06
1	2	85 4	43 0	7 8	2	0	0	08	08
1	9	65 7	30 4	13 7	2 8	0	0	14	15
1	2	58 3	3 1	0	0	0	0	30	26
1	2	48 3	4	0	0	0	0	40	38
1	1	59 4	0	0	0	0	0	50	46
1	1	5 8	0	0	0	0	0	75	75
1	1	0	0	0	0	0	0	1 00	1 00
pH 10 7									
1	4	100 0			93 4	78 2	44 4	0 00	0 00
1	2	97 8	95 7	90 5	73 9	44 6	6 4	02	02
1	1	92 2	65 5	79 3	45 7	9 0	0	03	03
1	1	72 4	74 1	64 6	31 2	2 8	0	04	04
1	1	85 3	82 8	64 6	16 2	2	0	05	05
1	2	85 8	74 5	67 2	35 2	9 0	0	06	06
1	6	86 6	75 7	39 5	7 9	4	0	16	16
1	3	87 9	33 2	8 3	3	0	0	30	29
1	3	81 4	18 0	3 0	0	0	0	40	40
1	3	74 8	9 6	6	0	0	0	53	52
1	1	37 7	2 6	0	0	0	0	75	75
1	1	31 8	7	0	0	0	0	1 00	1 00

[1] Interpolated figure

TABLE 2.—*Average survival of* Esch. coli, *expressed in percent of initial number, when exposed to chloramine in various concentrations at pH 6.5, 7.0, 7.8, 8.5, 9.5, and 10.5 at 20° to 25° C., with nitrogen content constant (0.3 p. p. m.) and contact of Cl_2 and N, 1 hour before addition of bacteria*

Number of strains	Number of tests	Average percentage surviving after exposure											Residual Cl_2 p. p. m. 0 minutes	Cl_2/N ratio
		1 minute	3 minutes	5 minutes	10 minutes	20 minutes	40 minutes	60 minutes	90 minutes	120 minutes	180 minutes	240 minutes		
						pH 6.5								
2	5	100.0						91.3		98.3		93.7	0.01	0-1
2	5	88.6				54.4	15.6	.5					.15	0.5-1
2	5	94.1		[1]79.3	60.8	27.2	.2	0	0	0			.30	1-1
2	5	81.7	88.5	49.0	20.7	.1	0	0					.60	2-1
2	5	72.5	57.5	36.8	2.4	0	0	0					.90	3-1
2	5	67.5	47.7	22.2	.8	0	0						1.20	4-1
2	5	56.2	17.2	.9	0	0	0						1.50	5-1
2	3	60.5	.1	0	0	0	0	0					1.80	6-1
						pH 7.0								
2	4	100.0				97.6	100.0	100.0		86.6	100.0	77.4	0.01	0-1
1	2	97.3		76.6	82.6	69.8	54.4	25.2		.1			.15	0.5-1
2	4	99.0		81.7	76.4	59.6	4.4	.1	0	0			.30	1-1
2	4	92.4		72.8	60.2	4.2	0	0	0	0			.60	2-1
2	4	96.2	85.9	78.2	23.5	.4	0	0	0				.90	3-1
2	4	78.4	61.0	41.2	3.2	0	0	0					1.20	4-1
2	4	72.1	52.5	17.8	.2	0	0	0					1.50	5-1
1	2	80.6	15.4	0	0	0	0	0					1.80	6-1
						pH 7.8								
2	2	100.0										100.0	0.00	0-1
2	2	100.0			87.0	81.8	39.8	8.7	1.3	0.3	0	0	.30	1-1
2	2	98.8		81.7	79.3	35.0	1.4	.1	0	0	0	0	.60	2-1
2	2	91.1		74.0	55.8	2.3	.1	0	0	0			.90	3-1
2	2	81.8		50.7	19.6	.1	0	0	0				1.20	4-1
2	2	76.0	67.9		3.8	0	0	0					1.50	5-1
2	2	67.4		36.6	6.0	0	0	0					1.80	6-1
						pH 8.5								
2	5	100.0						98.8		100.0		93.7	0.01	0-1
2	3	100.0	95.3	[1]98.5			92.6	94.2	83.4	67.5	28.8	6.5	.15	0.5-1
2	5	99.1	[1]98.3	[1]97.0	93.6	[1]90.5	78.9	62.9	32.0	14.6	4.1	.10	.30	1-1
2	5	97.9	[1]93.0	[1]89.1	79.7	72.9	42.4	12.8	1.8	0	0	0	.60	2-1
2	5	95.3	80.7	75.0	75.1	61.0	22.7	1.6	0	0	0		.90	3-1
2	5	89.7	75.8	74.0	63.6	30.5	1.4	0	0	0			1.20	4-1
2	5	87.1	67.1	65.7	46.9	9.0	0	0	0				1.50	5-1
2	3	43.1	19.1	10.1	.1	0	0	0					1.80	6-1
						pH 9.5								
2	5	100.0						98.9		97.6		92.8	0.015	0-1
1	2	100.0		98.1	88.2	94.0	98.6	99.2		83.4		17.1	.15	0.5-1
2	5	99.1				96.2	93.4	88.5		59.7	24.1	6.8	.30	1-1
2	5	100.0				92.5	82.3	52.6	21.5	4.2	.8	0	.60	2-1
2	5	95.8		[1]94.5	87.1	79.1	50.3	18.0	2.2	.2	0	0	.90	3-1
2	5	97.3	94.0	84.4	73.4	55.6	18.3	1.2	0	0			1.20	4-1
2	5	82.3	55.1	41.9	34.4	24.4	3.8	0	0	0			1.50	5-1
2	3	52.9	6.9	0	0	0	0	0					1.80	6-1
						pH 10.5								
2	5	100.0						87.6		74.2	67.8	74.4	0.01	0-1
1	3	96.1						100.0		93.7	84.2	65.6	.15	0.5-1
2	5	98.9						94.7		85.7	74.8	56.6	.30	1-1
2	5	97.2				100.0	100.0	90.0	70.8	73.2	39.7	20.7	.60	2-1
2	5	98.5			100.0	93.5	84.7	82.0	64.7	39.0	22.8	7.3	.90	3-1
2	5	96.4		96.5	92.4	91.2	77.2	63.6	24.4	30.3	5.4	.2	1.20	4-1
2	5	91.2	86.9	74.7	81.5	76.4	50.6	27.9	7.9	2.7	0	0	1.50	5-1
1	2	100.0	83.2	86.0	70.4	27.9	5.1	0	0	0			1.80	6-1

[1] Interpolated figure.

[1] Interpolated figure.

TABLE 3.—*Average survival of* Eber. typhosa, *expressed in percent of initial number, when exposed to free chlorine in various concentrations at pH 6.5, 7.0, 7.8, 8.5, 9.8, and 10.7 when held at 20° to 25° C.*

Number of strains	Number of tests	Average percentage surviving after exposure									Residual Cl_2 p. p m.	
		1 minute	3 minutes	5 minutes	10 minutes	15 minutes	20 minutes	30 minutes	40 minutes	60 minutes	0 minutes	60 minutes
						pH 6.5						
1	2	100.0			92.9	88.7				89 8	0 00	0 00
1	2	91.0	84.2	76.2	70.0		63.4			63 0	01	0 00
1	2	74.3	36.6	20.7	18.2		12.8			3 0	.02	02
1	2	36.6	16 4	7 2	2.8		2.1			0.2	.03	.03
1	2	8.6	0	0	0		0			0	.04	.04
1	2	1.6	.4	1.3	.1		0			0	.05	.05
1	2	0	0	0	0		0			0	.09	.07
						pH 7.0						
2	5	100.0				96 2		98 4		99 0	0 00	0.00
2	6	82 7	77.6	72 3	[1] 68.5	64.7	[1] 63.5	61 0		48 4	.02	
2	4	71.0	33.8	27.2	[1] 25.4	23.6	[1] 24.0	25.0		22.0	.03	
2	5	16.8	1.3	0.1	[1] 1	0	[1] 0	0		0	.04	
2	4	8 9	6.9	4.8	[1] 2.9	1.1	[1] .8	1		0	.05	
2	5	6.0	0	0	[1] 0	0	0	0		0	.06	.06
2	5	1 0	0	0	[1] 0	0		0		0	.08	.07
1	1	0	0	0	0	0		0		0	.15	.13
						pH 7.8						
1	1	97.4	93 4	74 3	67.1		50 3			26 3	0.02	0.02
2	2	58.6	21 6	18.9	14.6		14 0			13 2	.04	.04
2	2	21.0	4.4	1.7	1 0		.5			4	.06	.06
2	2	2.0	0	0	0		0			0	.09	.08
2	2	0	0	0	0		0			0	.11	.10
2	2	0	0	0	0		0			0	.15	.14
						pH 8.5						
1	2	100.0			95.7		93 1			87.5	0 00	0.00
1	1	81 6	47 7	13.2	.4		.3			6.0	.03	.02
1	2	70 2	2 4	0	0		0			0	.06	.04
1	2	42 8	.1	0	0		0			0	.08	.06
1	7	3.9	0	0	0		0			0	.15	.14
						pH 9.8						
1	2	100.0		[1] 87.7	72 5		61.2			28.0	0.00	0.00
1	1	93.1	85.6	55.2	7.7		.7			0	.05	.05
1	4	62.2	11 4	.6	0		0			0	.16	.16
1	2	26.0	0	0	0		0			0	.30	.28
1	2	17.0	0	0	0		0			0	.40	.36
1	1	6.0	0	0	0		0			0	.50	.46
1	1	.3	0	0	0		0			0	75	.65
1	1	0	0	0	0		0			0	1.00	.90
						pH 10.7						
1	3	100.0			47.1		27.3			10.5	0.00	0.00
1	2	92.8	82.8	78.6	48.8		18.0			.4	01	.01
1	1	97.8	69.3	61.4	20.7		1.3			0	.03	.02
1	2	85 4	62.9	35.9	5.6		.3			0	.04	.04
1	2	88.8	65.6	21.2	.9		.1			0	.06	.06
1	4	92.0	38.5	11.5	.8		0			0	.18	.15
1	2	72.6	6.3	.1	0		0			0	.30	.26
1	2	65.4	1.9	0	0		0			0	.40	.38
1	1	47.8	.7	0	0		0			0	.50	.50
1	1	31.8	0	0	0		0			0	.75	.75
1	1	8.2	0	0	0		0			0	1.00	1.0[illegible]

[1] Interpolated figure.

TABLE 4.—*Average survival of* Eber. typhosa, *expressed in percent of initial number, when exposed to chloramine in various concentrations at pH 6.5, 7.0, 7.8, 8.5, 9.5, and 10.5 at 20° to 25° C., with nitrogen content constant (0.3 p. p. m.) and contact of Cl_2 and N, 1 hour before addition of bacteria*

Number of strains	Number of tests	Average percentage surviving after exposure												Residual Cl_2 p. p. m. 0 minutes	Cl_2/N ratio
		1 minute	3 minutes	5 minutes	10 minutes	20 minutes	40 minutes	60 minutes	90 minutes	120 minutes	150 minutes	180 minutes	240 minutes		
							pH 6.5								
2	4	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	94.8	-----	0.01	0-1
2	4	94.3	-----	[1] 82.0	67.4	58.5	23.8	4.9	0.1	0.0	-----	0	-----	.15	.5-1
2	4	89.5	-----	68.2	55.2	20.8	0	0	0	0	-----	-----	-----	.30	1-1
2	4	77.8	59.6	52.7	21.4	0	0	0	0	0	-----	-----	-----	.61	2-1
2	4	67.6	50.0	28.8	.4	0	0	0	0	-----	-----	-----	-----	.90	3-1
2	4	54.2	29.7	3.7	0	0	0	0	-----	-----	-----	-----	-----	1.20	4-1
2	4	43.4	6.3	0	0	0	0	-----	-----	-----	-----	-----	-----	1.55	5-1
2	4	15.1	0	0	0	0	0	-----	-----	-----	-----	-----	-----	1.80	6-1
							pH 7.0								
2	4	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	97.8	-----	Trace	0-1
2	4	95.6	-----	[1] 94.9	-----	93.7	67.3	49.9	27.4	30.6	-----	3.4	0.6	0.15	.5-1
2	4	95.4	-----	83.1	77.4	62.6	13.4	1.3	0	0	-----	0	-----	.31	1-1
2	4	88.6	-----	79.1	58.0	5.7	.0	0	0	0	-----	-----	-----	.60	2-1
2	4	75.5	66.8	53.9	9.0	0	0	0	-----	-----	-----	-----	-----	.90	3-1
2	4	63.6	43.3	23.2	.3	0	0	0	-----	-----	-----	-----	-----	1.10	4-1
2	4	46.4	22.0	1.4	0	0	0	0	-----	-----	-----	-----	-----	1.45	5-1
2	4	20.6	.2	0	0	0	0	0	-----	-----	-----	-----	-----	1.60	6-1
							pH 7.8								
2	4	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	96.7	92.2	0.00	0-1
2	4	94.6	-----	-----	96.6	70.4	29.4	4.9	0.2	0.0	-----	0	0	.32	1-1
2	4	87.8	-----	76.8	60.7	20.1	.2	0	0	0	-----	0	-----	.63	2-1
2	4	83.8	73.7	55.3	38.4	3.2	0	0	0	0	-----	-----	-----	.94	3-1
2	4	75.1	54.7	48.0	12.1	0	0	0	0	-----	-----	-----	-----	1.26	4-1
2	4	59.4	43.0	25.4	5.2	0	0	0	0	-----	-----	-----	-----	1.48	5-1
2	4	24.5	2.0	0	0	0	0	0	-----	-----	-----	-----	-----	1.56	6-1
							pH 8.5								
2	4	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	96.2	98.0	0.00	0-1
2	4	93.4	-----	[1] 97.0	100.0	83.7	58.4	24.9	6.1	0.7	-----	0	0	.30	1-1
2	4	92.7	-----	90.3	81.2	53.6	15.8	6.7	0	0	-----	0	-----	.61	2-1
2	4	90.8	98.6	82.8	75.4	29.4	1.5	0	0	0	-----	-----	-----	92	3-1
2	4	85.6	100.0	80.7	45.2	5.4	0	0	0	-----	-----	-----	-----	1.20	4-1
2	5	86.1	74.0	55.1	22.3	6	0	0	-----	-----	-----	-----	-----	1.28	5-1
2	3	8.1	0	0	0	0	0	-----	-----	-----	-----	-----	-----	1.55	6-1
							pH 9.5								
2	4	100.0	-----	-----	-----	-----	-----	-----	-----	89.0	-----	-----	86.0	0.00	0-1
2	4	94.5	-----	-----	100.0	93.2	89.1	73.6	66.1	51.0	21.5	11.9	.4	.31	1-1
2	4	92.8	-----	96.0	92.4	86.2	67.9	55.6	35.8	8.4	8	0	0	.61	2-1
2	4	91.5	-----	100.0	79.2	73.9	52.4	33.7	4.1	.1	0	-----	-----	1.05	3-1
2	4	84.8	-----	77.9	71.6	54.6	29.0	6.3	0	0	-----	-----	-----	1.20	4-1
2	4	84.0	78.2	75.2	64.5	38.4	3.8	0	0	-----	-----	-----	-----	1.50	5-1
2	4	43.8	0	0	0	0	0	0	-----	-----	-----	-----	-----	1.80	6-1
							pH 10.5								
2	4	100.0	-----	-----	-----	-----	-----	73.3	-----	59.6	-----	37.5	40.1	0.00	0-1
2	4	89.0	-----	-----	-----	-----	85.4	75.6	55.2	54.9	52.0	30.0	17.4	.31	1-1
2	4	93.2	-----	-----	-----	86.6	78.2	71.2	40.9	36.8	-----	4.9	.5	.60	2-1
2	4	90.1	-----	-----	-----	89.1	69.5	44.8	21.3	7.0	-----	.3	0	.95	3-1
2	4	97.2	-----	-----	-----	85.3	54.5	30.3	7.8	1.9	-----	0	0	1.20	4-1
2	4	89.7	-----	86.8	76.2	68.8	27.4	6.6	.2	0	-----	-----	-----	1.45	5-1
2	4	76.2	70.0	15.7	1.5	0	0	0	-----	-----	-----	-----	-----	1.75	6-1

[1] Interpolated figure.

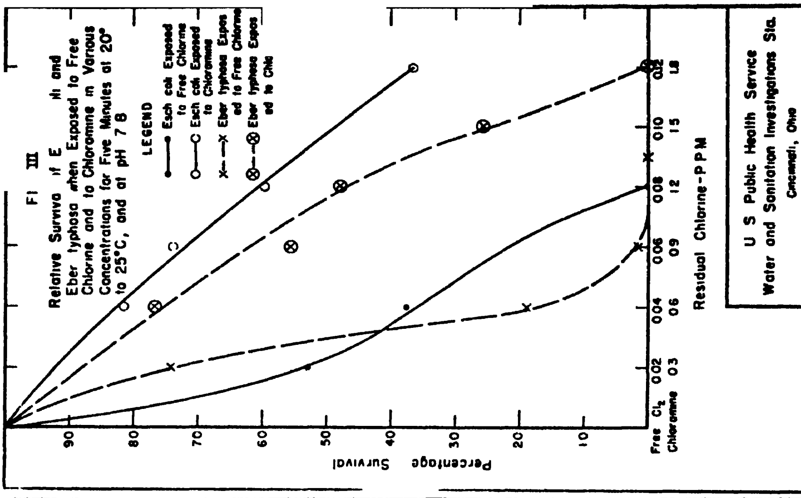
In figure 1, showing the relative survival of *Esch. coli* and *Eber. typhosa* at pH 6.5, it is noted that the strains of *Eber. typhosa* tested were definitely more resistant to free chlorine. With chloramine, both genera displayed approximately the same sensitivity until a residual chlorine concentration, as chloramine, of about 0.75 p. p. m. was reached. With increasing amounts of chloramine *Esch. coli* strains were more resistant, requiring 1.8 p. p. m. residual for a 100-percent kill in 5 minutes, whereas with *Eber. typhosa*, only about 1.5 p. p. m. were required.

Similar data are presented in figure 2 for tests carried on at pH 7.0. Again it is observed the strains of *Eber. typhosa* tested were more resistant to free chlorine than *Esch. coli* with all residuals tried. With concentrations of chloramine of less than about 0.75 p. p. m., *Eber. typhosa* was slightly more resistant than *Esch. coli*, while with greater concentration, *Eber. typhosa* was slightly more sensitive. With free chlorine a higher residual was required to obtain a 100-percent kill in 5 minutes at pH 7.0 than at pH 6.5 with both coli and typhosa.

In figure 3, presenting results obtained at pH 7.8, *Eber. typhosa* is not more resistant than *Esch. coli* throughout the range of concentrations tested, as was the case at pH 6.5 and 7.0. With concentrations of free chlorine of about 0.03 p. p. m. or less, typhosa was more resistant, while at greater concentrations of chlorine, typhosa became more sensitive than coli. With chloramine at pH 7.8, *Esch. coli* was found slightly more resistant than *Eber. typhosa* throughout the range of concentrations tested. Thus, a residual of more than 1.8 p. p. m. was required to produce a 100-percent kill, while all typhosa were killed in 5 minutes with this concentration.

In figure 4, the results obtained at pH 8.5 are shown. At this pH, *Eber. typhosa* was much more sensitive to free chlorine than *Esch. coli*, the latter requiring about twice as high a concentration as the former to produce a 100-percent kill in 5 minutes. When chloramine was used, only a very slight difference was noted in the death rates of these two genera, the same general curve being followed throughout the range of residuals tested. It is noted also that the free chlorine residual required to produce a 100-percent kill of *Eber. typhosa* at pH 8.5 was the same as that required at pH 7.0, while to produce the same result for *Esch. coli*, approximately three times as much chlorine was needed.

Similar data, obtained at pH 9.5, are presented in figure 5. At this pH, the difference in sensitivity of *Esch. coli* and *Eber. typhosa* was reduced greatly with both free chlorine and chloramine, with practically no variation in the rate of kill of either. It should be noted that at this pH 9.5, the concentrations of chlorine used had to be greatly



FI III
Relative Surviva if E ni and Eber typhosa when Exposed to Free Chlorine and to Chloramine in Various Concentrations for Five Minutes at 20° to 25°C, and at pH 7 8
LEGEND
Esch coli Exposed to Free Chlorine
Esch coli Exposed to Chloramine
Eber typhosa Exposed to Free Chlorine
Eber typhosa Exposed to Chloramine
Percentage Survival
Free Cl2
Chloramine
Residual Chlorine-PPM
U S Public Health Service
Water and Sanitation Investigations Sta.
Cincinnati, Ohio

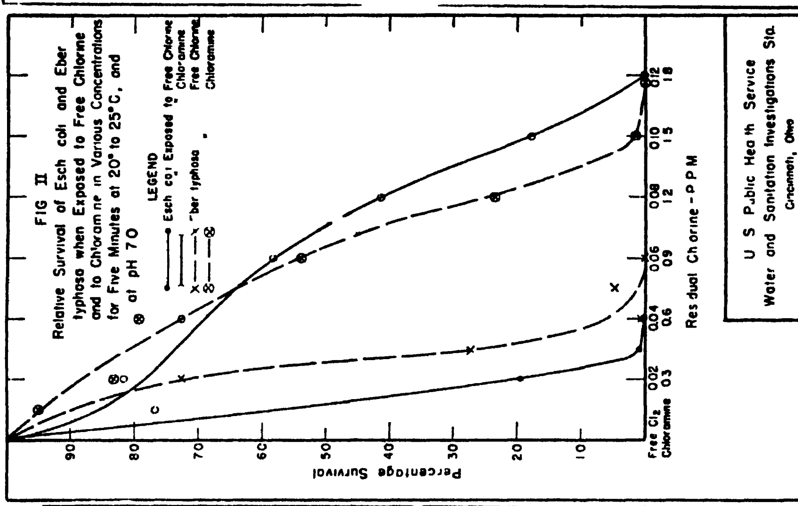


FIG II
Relative Survival of Esch coli and Eber typhosa when Exposed to Free Chlorine and to Chloramine in Various Concentrations for Five Minutes at 20° to 25°C, and at pH 7 0
LEGEND
Esch coli Exposed to Free Chlorine
Chloramine
Eber typhosa
Free Chlorine
Chloramine
Percentage Survival
Free Cl2
Chloramine
Residual Chlorine-P P M
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Water and Sanitation Investigations Sta.
Cincinnati, Ohio

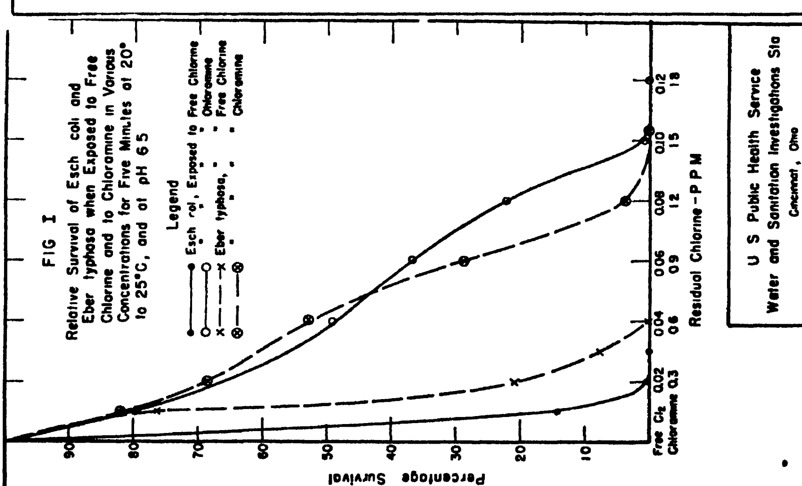

FIG I
Relative Survival of Esch coli and Eber typhosa when Exposed to Free Chlorine and to Chloramine in Various Concentrations for Five Minutes at 20° to 25°C, and at pH 6 5
Legend
Esch coli, Exposed to Free Chlorine
Chloramine
Eber typhosa,
Free Chlorine
Chloramine
Percentage Survival
Free Cl2
Chloramine
Residual Chlorine-P P M
U S Public Health Service
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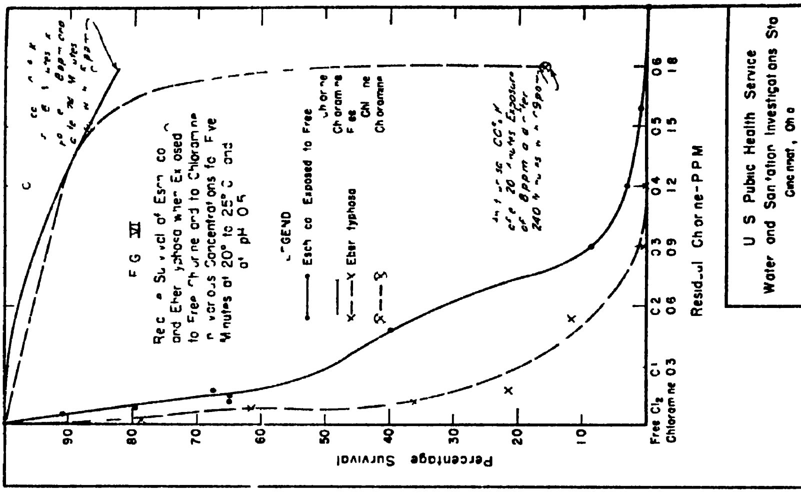
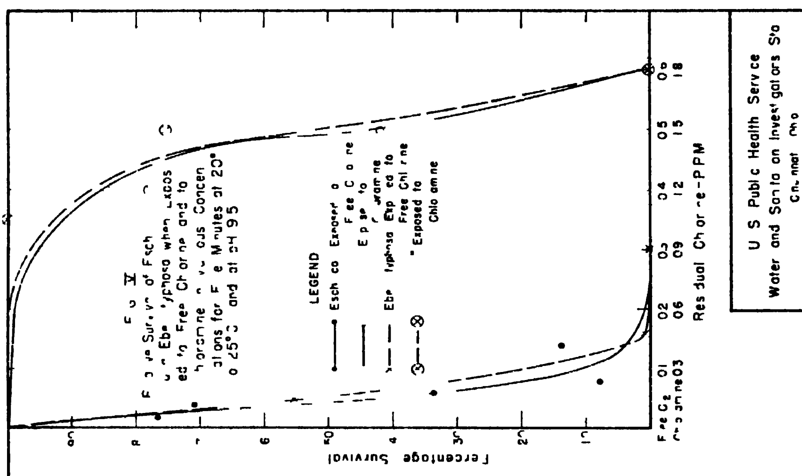
increased to produce reasonable rates of kill. Apparently differences in sensitivity may be overcome by higher concentrations of chlorine.

Figure 6 shows the relative sensitivity of *Eber. typhosa* and *Esch. coli* to free chlorine and chloramine in waters of pH 10.5. Here the trends with both free chlorine and chloramine are similar to those observed at pH 8.5 and 9.5. Here also, with increasing pH, greater residuals of both free chlorine and chloramine were required to produce equivalent kills. For instance, at pH 10.5, for *Eber. typhosa* a residual of 0.4 p. p. m. and for *Esch. coli* more than 0.7 p. p. m. of free chlorine was required to produce 100-percent kills in 5 minutes, while with chloramine *Eber. typhosa* required a residual of 1.8 p. p. m. for a 20-minute period, or 0.9 p. p. m. for 4 hours, and *Esch. coli* an exposure of 1.8 p. p. m. for 60 minutes, or 1.5 p. p. m. for 4 hours to produce similar results.

DISCUSSION AND SUMMARY

Data have been presented showing the relative resistance of *Eber. typhosa* and *Esch. coli* strains to free chlorine and to chloramine in waters held at 20° to 25° C. and buffered at pH 6.5, 7.0, 7 8, 8.5, 9.5, and 10.5. Each figure in the tables and each point plotted on the charts represents the average of from two to eight determinations under the conditions given. Although a statistical analysis of the results is not within the scope of this report, a study has been made of the differences between individual observations, with particular reference to (1) variations in resistance of the same strains in different tests, (2) variations in resistance between different strains, and (3) routine observational errors. The results with free chlorine indicated that (1) at pH 6.5 and 7.0 typhosa strains were consistently more resistant than coli strains, (2) at pH 7.8 coli strains were more resistant with concentrations of free chlorine in excess of about 0.03 p.p.m., and (3) at pH 8.5 or above all strains of *Esch. coli* tested were consistently as resistant, and usually much more resistant, to free chlorine than any *Eber. typhosa* strains. Consequently, while the range of probable error does not permit a definite allocation of the pH, between 7.0 and 8.5, where the "change-over" in sensitivity occurs, the consistency of the results at pH 6.5 and 7.0, and at pH 8.5 or above, leaves no doubt as to the existence of the "change-over." This "change-over" in sensitivity with increasing pH was marked by the condition that *Esch. coli* required greater increases in chlorine concentration than *Eber. typhosa* to produce equivalent kills. Although factual information is not available to support the theory, it would seem that the cells of *Eber. typhosa* might become more sensitive to free chlorine with increasing pH, due to some function of their capsular substance. Perhaps the capsular substance is less permeable to chlorine at lower


Percentage Survival
Residual Chlorine-PPM
LEGEND
Esch coli Exposed to Free
Eber typhosa
U S Public Health Service
Water and Sanitation Investigations Sta


Percentage Survival
LEGEND
U S Public Health Service

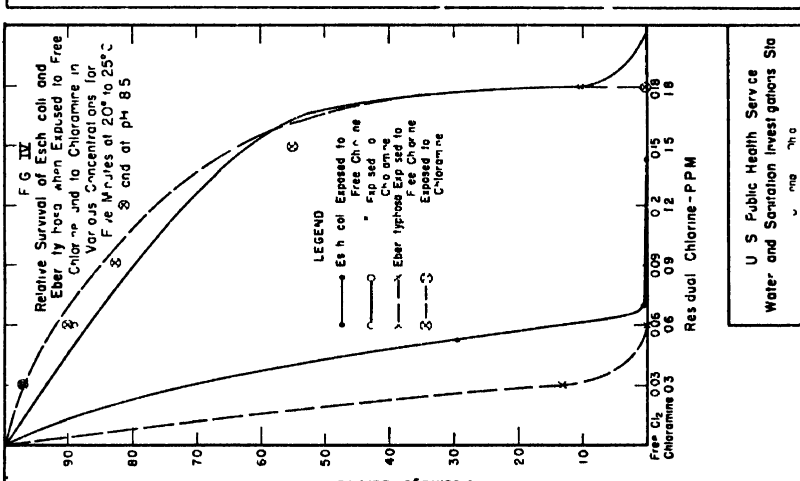


FIG IV
Relative Survival of Esch coli and
Percentage Survival
Residual Chlorine-PPM
LEGEND
U S Public Health Service
Water and Sanitation Investigations Sta

pH values. If this were true then the more heavily encapsulated *Eber. typhosa* would be more resistant under such conditions.

When chloramine was used as the bactericidal agent, only slight differences were observed in the sensitivity of the two genera studied. In a few instances *Esch. coli* was more resistant to chloramine than *Eber. typhosa*, particularly at pH 7.8 and 10.5, but in general they were about equally sensitive.

The pronounced difference in the bactericidal properties of chlorine and chloramine should also be noted. At normal pH values approximately 40 times more residual chlorine as chloramine was required to produce a 100-percent kill of *Esch. coli* in the same time interval For *Eber. typhosa* this ratio was about 25 to 1.

On the basis of the time required to produce a 100-percent kill with equivalent amounts of residual chlorine, as free chlorine, and as chloramine, results were not readily obtainable for the lower pH zones. In this range the lethal amounts of free chlorine are much less than the amount of chloramine required to produce a 100-percent kill in any reasonable period (4 to 6 hours). At pH 9.5, where such comparisons were possible, chloramine required approximately 100-fold the period for free chlorine.

REFERENCES

(*1*) Butterfield, C T, Wattie, Elsie, Megregian, Stephen, and Chambers C. W.: Influence of pH and temperature on the survival of coliforms and enteric pathogens when exposed to free chlorine. Pub. Health Rep., **58**:1837 (1943). Reprint No. 2530.

STUDIES OF ANTIGENS IN INFECTED YOLK SACS[1]

By NORMAN H. TOPPING, *Surgeon*, and M. J. SHEAR, *Principal Biochemist, United States Public Health Service*

The material for these studies was derived from yolk sacs infected with the Breinl strain of epidemic typhus fever after the method described by Cox. This strain has been carried in developing eggs for some time and is well adapted. It has become less virulent for guinea pigs but does produce, on occasion, large numbers of rickettsiae in the yolk sacs.

Clark, Rasmussen, and White have reported the use of ether in the separation of poliomyelitis virus from extraneous material, and Craigie has applied the use of ether to rickettsiae [2]. Craigie's technique gives a clean vaccine containing relatively large numbers of rickettsiae and is perhaps an improvement on the technique as described by Cox.

[1] This manuscript, Section III of Studies of Typhus Fever (National Institute of Health Bulletin No 183 (in press)), was approved for publication March 18, 1942, and scheduled for publication in Public Health Reports in the issue of March 27, 1942 Because of the subject matter the paper was withheld from publication at that time

[2] Personal communication from Dr Craigie

We have employed certain modifications of the ether technique and have found an additional antigenic material in the developing yolk sac which is being discarded in the technique as described by Craigie. This substance can be found in the supernatant fluid after the first centrifugation. This immunizing substance has many of the characteristics usually found in "soluble antigens" in that some of it passes a Berkefeld N filter and the major portion remains in solution after centrifugation for 15 minutes at about 15,000 r. p. m. It has not been determined whether this substance is a true "soluble antigen" or whether it consists of minute rickettsiae or other bodies so small as to pass a filter and not be precipitated by centrifugation as described. Other academic questions regarding its chemical nature and properties are being pursued; however, some of its immunological properties have been briefly studied to date.

For purposes of discussion, we shall designate the substance present in the supernatant fluid after centrifugation as the "soluble antigen," while the antigen present in the precipitate will be designated as "rickettsiae" because they are demonstrable there in large numbers. Three separate immunological procedures have been studied in comparing these two antigens. The first of these techniques was complement fixation as described previously by Bengtson; the second was the ability of these two antigens to produce the Weil-Felix reaction in rabbits; and the third was a comparison of these two antigens in immunizing guinea pigs against a challenging dose of a passage strain of epidemic typhus fever virus.

Our technique for the preparation of the antigens is briefly as follows: (1) infected yolk sacs are harvested; (2) ground with alundum; (3) diluted to a 10-percent suspension with saline containing 0.5-percent formalin; (4) shaken with one volume of ether, and sufficient time allowed to elapse for the phases to separate well (about 1 to 1½ hours); (5) repeated extraction of the aqueous phase (either once or twice) until the excess ether is colorless; (6) removal of the ether at room temperature under reduced pressure.

After centrifugation, the sediment containing large numbers of demonstrable rickettsiae was resuspended in saline to the original volume; this suspension and the clear supernatant containing the "soluble antigen" were tested for their ability to fix complement in the presence of specific immune guinea pig serums. Two of these titrations are presented in table 6.

TABLE 6 [1]

Number	Primary manipulation: Manipulation	Designation	Material	Complement fixation reaction	Secondary manipulation: Manipulation	Designation	Material	Complement fixation reaction [2]
ET34	Centrifuged 4,000 r p m 1 hour	a	Sediment (contains rickettsiae)	Pos 1:8				
		b	Supernatant (soluble antigen)	Pos 1:128	Centrifuged 15,000 r p m 15 min	c	Supernatant	Pos 1:128
						d	Sediment	Negative.
ET5	Centrifuged 4,000 r p m 1 hour.	a	Sediment (contains rickettsiae	Pos 1:32	Washed and recentrifuged at 4,000 r p m	d	Sediment	Pos 1:32
						e	Supernatant	Negative
		b	Supernatant (soluble antigen)	Pos 1:64	Filtered Berkefeld N	c	Filtrate	Pos 1:16.

[1] Tables 1 to 5 will be found in Studies of Typhus Fever Vaccine, Sections I and II, National Institute of Health Bulletin No 183 (in press)

[2] Only 3+ and 4+ reactions were considered positive.

It will be noted in table 6 that there were two separate lots, ET-34 and ET-5; these lots were composed of three pooled yolk sacs each. It is known that there is usually a considerable variation in the numbers of rickettsiae to be found in the harvested yolk sacs and that the amount of antigen present is roughly proportionate to the numbers of rickettsiae present in the preliminary smear preparation direct from the yolk sac. In both lots in table 6 the supernatant fluid fixed complement to a higher dilution than did the sediment, and further, this antigen in the supernatant was not sedimented at 15,000 r. p. m. for 15 minutes, nor was it completely removed by filtration through a Berkefeld N. It will also be seen that one washing of the rickettsiae of the sediment No. 5a did not remove the complement-fixing antibody.

A control experiment was done using a supernatant solution and a sediment prepared in an identical manner but from eggs not inoculated with epidemic typhus virus. The results were entirely negative with both fractions. Further, these two fractions were each inoculated into four guinea pigs; two inoculations of 1 cc. each were given at weekly intervals. Both fractions failed to produce complement-fixing antibodies in their serums.

Several of the fractions containing antigenic properties, as tested by the complement fixation test, have been injected intravenously into rabbits and observation made of the Weil-Felix reaction. Two of these are presented in table 7

TABLE 7

Rabbit number	Original Weil-Felix			Inoculated with	Date	Weil-Felix						
						Date						
	1 10	1 20	1 40			Feb 18	Feb 20	Feb 23	Feb 26	Mar 2	Mar 5	Mar 10
29304	[1] 2	1	0	ET-5d (sediment table 6)	Feb. 11, 1942	Pos [1] 1 40	Pos 1 320	Pos 1 160	Pos 1 320	Pos 1 80	Pos 1 40	Pos 1 40
29305	3	0	0	ET-5b (supernatant table 6)	...do	Pos. 1 160	Pos 1 320	Pos 1 160	Pos 1 80	Pos 1 40	Pos 1 40	Pos 1 20

[1] Only 3+ and 4+ reactions were considered positive

Table 7 shows that both the sediment ET-5d and the supernatant solution, ET-5b, are about equally effective in producing the Weil-Felix reaction in rabbits.

These fractions have been inoculated into guinea pigs for the purpose of observing their ability to produce complement-fixing antibodies, as well as to immunize them against a challenge inoculation of living epidemic typhus virus. The results of these tests are presented in table 8.

TABLE 8

Guinea pig number	Immunizing material 1 cc each of—	Dates	Date bled	Complement fixation	Date of challenge with 10 percent Breinl strain	Days of fever	Comment
29314	ET5b, ET34b (supernatants)[1]	Feb. 11, 19	Feb. 26	1:64	Feb. 28, 1942	2	Abscess palpable in abdomen.
29315	do	do	do	1:256	do	0	Immune
29316	do	do	do	1:512	do	0	Do
29317	do	do	do	1:512	do	0	Do
29318	ET5d, ET34a (Sediments)[1]	do	do	1:16	do	3	Abscess palpable in abdomen
29319	do	do	do	1:512	do	0	Immune
29320	do	do	do	1:128	do	0	Do
29321	do	do	do	1:256	do	0	Do
29468	Controls					8+	No immunity
29469						6+	Do
29470						8+	Do
29471						8+	Do.

[1] See Table 6

In table 8 it will be noted that the four guinea pigs vaccinated with the soluble fraction produced complement-fixing antibodies in their serums at least as well as did the four guinea pigs vaccinated with the sediment containing the rickettsiae. This same statement can be made concerning their immunity. It is interesting further to note that in each group of four guinea pigs there was one (29314 and 29318) that did not produce as high a titer in the complement fixation test as the others, and that each of these guinea pigs developed fever during the immunity test. In both of these male guinea pigs a large abdominal abscess could be palpated easily, perhaps due to a perforation of the rectum while temperatures were being taken. Any attempted explanation of these results would only be conjecture.

From the foregoing evidence it would appear that there is a "soluble" substance present in the supernatant fluid after ether extraction and centrifugation that has the same immunological properties (as far as we have gone) as does the sediment containing the rickettsiae. This substance is antigenic in the complement fixation test, produces a Weil-Felix reaction when inoculated into rabbits, produces complement-fixing antibodies in the serums of vaccinated guinea pigs, and finally immunizes those guinea pigs against a subsequent inoculation of virulent epidemic typhus virus.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 5–December 2, 1944

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section

"Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended December 2, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—The total of 670 cases of meningococcus meningitis reported for the 4 weeks ended December 2 was lower than the 1943 figure (957 cases) for this period, but it was 4.5 times the 1939–43 median. The number of cases was higher than in 1943 in only the West South Central section, but all sections reported excesses over the seasonal expectancy. Since there were 3 low years of this disease, preceding the current high wave, the 1939–43 median falls within that period. Compared with the median for earlier years the current incidence, however, is still high; the median for the corresponding period in 1934–38 and 1929–33 was 279 cases for each period.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 8,464 during the preceding 4 weeks to 997 for the 4 weeks ended December 2. While the cases of poliomyelitis have declined gradually since the peak was reached during the week ended August 2, the incidence has continued at a relatively high level as compared with prior years. The number of cases reported for the current 4 weeks was about 30 percent above the number (755) reported for the corresponding period in 1943, and almost 60 percent greater than the 1939–43 median. All sections except the West South Central and Mountain and Pacific reported an excess of cases over 1943, and all except the Mountain region reported an excess over the preceding 5-year median. The Atlantic Coast region continued to report the largest increases over the normal seasonal expectancy. In the first 48 weeks of 1944 there have been 18,885 cases reported, as compared with 12,134 and 8,899 in the years 1943 and 1941, respectively. In 1942 there was no particular outbreak of poliomyelitis and the number of cases for the same weeks totaled approximately 4,000.

Scarlet fever.– The usual seasonal rise of scarlet fever was apparent in all sections of the country during the 4 weeks ended December 2. The number of cases (12,577) was slightly above the 1943 figure for the same weeks, and about 20 percent above the 1939–43 median. Fewer cases than normally occur were reported from the West North

Central and East South Central regions, but in all other regions the incidence was above the normal seasonal expectancy, the excesses ranging from 10 percent in the East North Central region to 65 percent in the Mountain region.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—During the 4 weeks ended December 2 the incidence of diphtheria (1,826 cases) was about 20 percent above that recorded for the corresponding period in 1943. The 1939–43 median was approximately 1,900 cases. The largest increase over the expected seasonal incidence was reported from the West South Central section. Minor increases occurred in the East South Central and Pacific sections, and in other sections the number of cases either closely approximated the 5-year median or fell considerably below.

Influenza.—For the current 4-week period there were 7,127 cases of influenza reported, as compared with 10,243 for the same weeks in 1943 and a 5-year median of 7,581 cases. The West South Central section reported a 40-percent increase in the number of cases over the 1939–43 median and, while the number of cases (99) in the New England section was not large, it was more than 6 times the normal seasonal expectancy. In all other sections the incidence was comparatively low. Seventy-five percent of the total cases were reported from 4 States, viz, Texas (3,530 cases), South Carolina (1,245), Virginia (652), and Arizona (262).

Measles.—The incidence of measles during the current 4 weeks was comparatively low, the number of cases (2,715) being about 25 percent of the 1939–43 median figure for this period. For the country as a whole and for each geographic section except the New England, West South Central, and Pacific, the current incidence was the lowest for this period in the 16 years for which these data are available.

Smallpox.—The incidence of smallpox was the lowest on record for this period. The number of cases (17) was less than 40 percent of the comparatively low incidence reported in 1943, and less than 15 percent of the 1939–43 median.

Typhoid and paratyphoid fever.—This disease also remained at a relatively low level, the number of cases (297) being the lowest on record for this period. The 1939–43 median was 578 cases. A slight increase over the normal seasonal incidence was reported from the Pacific section; in the Middle Atlantic and Mountain regions the numbers of cases were about normal, and in all other sections the number of cases was below the preceding 5-year median.

Whooping cough.—The number of cases of whooping cough was below normal for this season. For the 4 weeks ended Decem'

Number of reported cases of 9 communicable diseases in the United States during the 4-week period November 5–December 2, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,828	1,528	1,904	7,127	10,243	7,581	2,715	18,239	10,851
New England	30	44	27	99	90	16	500	1,457	1,481
Middle Atlantic	119	89	144	19	78	74	398	3,136	2,743
East North Central	181	175	277	127	362	285	261	6,211	1,064
West North Central	158	159	152	70	893	77	142	3,308	620
South Atlantic	365	334	591	2,097	2,829	2,681	150	2,055	641
East South Central	276	201	222	200	695	399	65	411	310
West South Central	450	274	347	3,033	4,037	2,845	130	327	173
Mountain	54	70	70	454	1,119	715	92	738	738
Pacific	195	182	122	128	140	229	977	596	1,438
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	670	957	145	997	755	635	12,577	11,836	10,464
New England	54	95	19	52	50	10	1,172	977	946
Middle Atlantic	179	250	47	435	65	65	2,016	2,078	1,814
East North Central	152	178	22	147	120	120	3,249	2,970	2,[illegible]70
West North Central	37	61	8	73	60	60	1,185	1,275	1,223
South Atlantic	68	152	26	114	9	75	1,655	1,446	1,446
East South Central	64	64	19	40	20	35	707	563	828
West South Central	39	34	17	35	76	33	622	526	413
Mountain	12	19	9	15	63	27	669	642	405
Pacific	65	104	10	86	292	82	1,302	1,359	580
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	17	46	128	297	312	578	7,410	9,973	13,366
New England	0	0	0	15	16	14	1,090	778	1,342
Middle Atlantic	0	0	0	38	64	103	1,797	2,112	3,711
East North Central	6	29	45	31	32	55	1,305	2,466	2,863
West North Central	6	7	26	9	14	31	433	665	665
South Atlantic	2	1	1	45	32	108	983	1,695	1,420
East South Central	0	1	4	32	31	50	250	527	531
West South Central	1	6	19	70	76	105	717	526	495
Mountain	2	1	4	32	34	32	308	467	467
Pacific	0	1	8	25	13	17	527	737	1,018

[1] Mississippi and New York excluded, New York City included
[2] Mississippi excluded

there were 7,410 cases reported, as compared with 9,973 for the corresponding period in 1943 and a 5-year median of 13,336 cases. The incidence was slightly above the seasonal expectancy in the West South Central section, but in all other regions the cases reported were considerably below the 1939–43 median.

MORTALITY, ALL CAUSES

For the 4 weeks ended December 2 there were 35,633 deaths from all causes reported to the Bureau of the Census by 93 large cities. The average number reported for the corresponding period in 1941–43 was 35,608 deaths. The number of deaths was above the 3-year average in each of the first 2 weeks of the current period, and below during the third and fourth weeks.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 9, 1944

Summary

Continuing the upward trend, the incidence of meningococcus meningitis increased during the current week. A total of 190 cases was reported for the week, as compared with 172 last week, 287 for the corresponding week last year, and a 5-year (1939-43) median of 35 cases. States reporting 9 or more cases are New York (26), Pennsylvania (17), California (14), Illinois (12), Massachusetts (10), and Ohio, Texas, and Washington (9 each). Since the week ended March 4 the weekly incidence of the disease for the country as a whole has been continuously below that of last year; but to date, with the exception of one week, it has been above that for any other year for which comparable weekly records are available (since 1927). The cumulative figure since the week ended March 4 is 10,451, as compared with 13,293 for the same period last year. The largest number of cases reported for any other entire year was 10,551, in 1929.

The incidence of poliomyelitis continues to decline. A total of 133 cases was reported, as compared with 174 last week and 96 for the corresponding week last year, which is also the 5-year median. Of the current total, 82 cases were reported in 4 States—New York (46), California (16), Washington (11), and Ohio (9). The cumulative total to date is 19,019 as compared with 12,230 for the same period last year and a 5-year median of 8,904.

The current figures for influenza, measles, smallpox, typhoid fever, and whooping cough are below the corresponding figures for last year and the 5-year medians, while the current totals for diphtheria and scarlet fever are slightly above the 5-year medians and the corresponding figures for last year.

Deaths recorded in 92 large cities in the United States for the current week total 9,313, as compared with 9,373 last week, 10,442 for the corresponding week last year, and a 3-year (1941-43) average of 9,449. The cumulative total to date is 438,941, as compared with 447,9′ the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended December 9, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred

Division and State	Diphtheria			Influenza			Measles			Meningitis meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Dec 9 1944	Dec 11 1943		Dec 9 1944	Dec 11 1943		Dec 9 1944	Dec 11 1943		Dec 9, 1944	Dec 11, 1943	
NEW ENGLAND												
Maine	0	3	1		22	2	2	98	54	1	0	0
New Hampshire	0	0	0				1	8	8	0	0	0
Vermont	0	0	0				2	34	24	0	0	0
Massachusetts	11	9	3				50	325	324	10	16	5
Rhode Island	1	0	1	25	1		1	67	20	1	4	1
Connecticut	0	2	1	1	98	2	16	8	46	3	5	1
MIDDLE ATLANTIC												
New York	6	16	16	2	[1] 70	[1] 12	56	600	509	26	41	3
New Jersey	3	4	4	2	50	9	17	405	25	7	11	1
Pennsylvania	17	11	11	3	13		27	410	495	17	34	5
EAST NORTH CENTRAL												
Ohio	17	14	14	9	4	14	20	2 035	36	9	16	1
Indiana	18	13	13	10	286	12	4	80	20	3	3	1
Illinois		5	21	8	447	10	41	174	69	12	22	2
Michigan [2]	14	9	7	1	63	6	24	673	271	8	11	0
Wisconsin	2	1	1	16	130	34	17	482	140	5	8	2
WEST NORTH CENTRAL												
Minnesota	10	9	5	2	396	2	4	437	33	1	1	0
Iowa	7	1	2		2 337	3	31	41	40	5	0	0
Missouri	10	6	6	3	137	2	1	22	7	5	12	0
North Dakota	18	2	2	10	4 331	10	3	380	17	0	0	0
South Dakota	1	1	1				0	71	1	0	0	0
Nebraska	6	2	2				7	6	6	0	0	0
Kansas	2	11	4	2	197	14	8	11	32	0	3	0
SOUTH ATLANTIC												
Delaware	0	0	0				5	18	2	0	1	0
Maryland [2]	10	5	5	3	62	8	4	36	6	4	6	4
District of Columbia	0	0	2	1	245	2	3	28	3	2	1	0
Virginia	5	11	26	287	1 649	250	6	550	69	4	8	0
West Virginia	6	5	7	12	629	16	8	60	11	1	4	2
North Carolina	20	28	28		3	6	11	166	139	1	5	2
South Carolina	3	5	15	222	755	517	3	45	20	2	3	1
Georgia	17	7	19	53	676	133	2	55	27	2	3	0
Florida	5	4	7		16	10	3	23	2	5	1	1
EAST SOUTH CENTRAL												
Kentucky	14	3	8	1	5 416	6	3	6	22	2	6	0
Tennessee	11	9	11	20	285	30	29	20	21	4	3	1
Alabama	19	11	17	58	306	80	1	163	14	3	2	1
Mississippi [2]	12	9	9							2	0	1
WEST SOUTH CENTRAL												
Arkansas	5	9	15	59	427	99	3	23	22	3	1	0
Louisiana	15	6	8	1	84	13	3	1	1	2	2	1
Oklahoma	6	3	17	130	201	185	6	11	6	1	3	1
Texas	56	37	45	1 352	2 921	732	25	78	64	9	8	1
MOUNTAIN												
Montana	2	0	1	21	34	12	3	103	52	0	1	0
Idaho	4	0	0	3	2		1	1	8	1	1	0
Wyoming	0	1	1	11	11	11	0	19	6	0	1	0
Colorado	3	3	10	11	322	49	2	165	28	1	1	1
New Mexico	9	1	2		18		1	0	2	0	0	0
Arizona	1	9	1	61	950	127	1	12	12	0	1	0
Utah [2]	0	0	0	3	56	56	8	12	29	3	2	0
Nevada	0	0	0				1	1	1	0	1	0
PACIFIC												
Washington	8	7	1	1	2	2	34	43	43	9	1	1
Oregon	5	3	2	14	25	25	30	50	40	2	8	2
California	33	22	23	31	69	69	249	105	105	14	26	2
Total	415	317	393	2 449	23 746	4 325	777	8 161	4,285	190	287	35
49 weeks	12 995	12 960	14 739	358 761	126 643	169 793	600 050	580 588	491 288	15 488	16 817	1 915

[1] New York City only [2] Period ended earlier than Saturday

Telegraphic morbidity reports from State health officers for the week ended December 9, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Dec. 9, 1944	Dec. 11, 1943		Dec. 9, 1944	Dec. 11, 1943		Dec. 9, 1944	Dec. 11, 1943		Dec. 9, 1944	Dec. 11, 1943	
NEW ENGLAND												
Maine	1	0	1	45	21	19	0	0	0	3	0	1
New Hampshire	0	0	0	21	6	3	0	0	0	0	0	0
Vermont	0	0	0	10	7	6	0	0	0	0	0	0
Massachusetts	4	4	2	233	244	244	0	0	0	4	2	2
Rhode Island	0	0	0	13	6	7	0	0	0	0	0	0
Connecticut	0	0	0	34	47	39	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	46	14	6	287	353	278	0	0	0	7	5	6
New Jersey	4	0	2	76	99	99	0	0	0	4	1	2
Pennsylvania	3	0	2	247	213	225	0	0	0	4	6	6
EAST NORTH CENTRAL												
Ohio	9	1	2	345	278	278	1	0	0	8	0	6
Indiana	0	0	1	145	57	99	4	0	3	1	1	1
Illinois	3	4	4	223	202	202	0	1	1	1	1	2
Michigan [2]	3	4	3	212	154	154	2	0	1	0	1	1
Wisconsin	3	1	1	92	148	146	0	0	1	0	0	1
WEST NORTH CENTRAL												
Minnesota	0	0	2	56	110	89	0	0	1	0	0	0
Iowa	3	0	2	52	67	67	0	1	3	1	0	0
Missouri	2	1	0	41	64	64	0	0	0	1	1	2
North Dakota	0	1	1	14	17	17	0	0	0	0	0	0
South Dakota	0	0	0	7	33	33	0	0	0	0	1	0
Nebraska	0	0	0	54	31	20	0	1	0	0	0	0
Kansas	1	3	2	104	93	88	1	4	0	1	0	1
SOUTH ATLANTIC												
Delaware	1	0	0	7	7	12	0	0	0	0	0	0
Maryland [2]	1	0	1	119	88	[illegible]	0	0	0	1	2	2
District of Columbia	1	0	0	24	23	15	0	0	0	0	0	0
Virginia	2	1	1	69	40	52	0	0	0	5	2	2
West Virginia	1	1	1	72	50	50	0	0	0	0	2	2
North Carolina	5	1	1	96	107	105	0	0	0	1	1	2
South Carolina	0	0	1	12	8	20	0	1	0	3	3	3
Georgia	1	1	1	34	15	34	1	0	0	4	0	4
Florida	0	1	0	14	23	7	0	0	0	0	1	1
EAST SOUTH CENTRAL												
Kentucky	2	2	2	49	75	75	0	0	0	0	1	3
Tennessee	0	0	0	57	78	74	0	0	0	2	1	7
Alabama	1	0	0	31	20	35	0	0	0	0	1	0
Mississippi [2]	0	0	1	17	9	20	0	0	0	1	3	3
WEST SOUTH CENTRAL												
Arkansas	2	1	1	15	6	6	0	0	1	0	0	3
Louisiana	0	1	1	14	7	8	1	0	0	1	0	5
Oklahoma	1	5	1	32	26	24	0	0	0	2	5	2
Texas	2	10	4	102	63	56	0	1	1	4	10	10
MOUNTAIN												
Montana	0	1	0	22	32	32	0	1	1	2	0	0
Idaho	0	0	0	65	52	10	0	0	0	0	0	0
Wyoming	0	1	0	8	3	7	0	0	0	1	0	0
Colorado	0	4	2	59	36	36	0	0	0	0	0	0
New Mexico	2	1	0	21	1	12	0	0	0	0	4	3
Arizona	0	0	0	9	18	4	0	2	0	0	0	0
Utah [2]	0	2	1	19	88	22	0	0	0	1	1	0
Nevada	0	0	0	2	2	0	1	0	0	0	1	0
PACIFIC												
Washington	11	7	2	113	152	29	0	0	0	1	0	0
Oregon	2	9	1	37	99	20	0	0	0	3	0	0
California	16	14	13	338	179	144	0	0	0	3	26	5
Total	133	96	96	3,768	3,557	3,091	11	12	25	71	84	127
49 weeks	[4] 19,019	12,230	8,904	179,335	131,727	131,727	[4] 371	713	1,323	5,247	5,306	8,239

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: Maine, 2; Massachusetts, 2, New Jersey, 1; Ohio, 1; Indiana, 1, Illinois, 1; Iowa, 1; South Carolina, 1; Georgia, 3.
[4] Cumulative totals changed by corrected reports.

Telegraphic morbidity reports from State health officers for the week ended December 9, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Dec. 9, 1944	Whooping cough: Week ended— Dec. 11, 1943	Whooping cough: Median 1939-43	Week ended December 9, 1944: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	3	10	[illegible]	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	7	0	0	0	0	0	0	0	0	0
Vermont	39	30	30	0	0	1	0	0	0	0	0	0
Massachusetts	121	91	[illegible]	0	0	[illegible]	0	1	0	0	0	0
Rhode Island	[illegible]	21	24	0	0	2	0	0	0	0	0	0
Connecticut	90	22	61	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	288	34	473	0	3	42	0	2	0	0	0	0
New Jersey	72	[illegible]	171	0	4	0	0	1	0	0	0	0
Pennsylvania	[illegible]	[illegible]	303	0	0	0	0	0	0	0	3	0
EAST NORTH CENTRAL												
Ohio	119	[illegible]	152	0	0	0	0	0	0	0	3	0
Indiana	7	[illegible]	[illegible]	0	2	0	0	0	0	0	11	0
Illinois	[illegible]	101	110	0	0	1	0	0	0	0	[illegible]	0
Michigan [2]	[illegible]	204	[illegible]	0	0	3	0	0	0	0	0	0
Wisconsin	82	135	[illegible]	0	7	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	30	4	2	0	3	3	0	0	0	0	0	0
Iowa	2	23	27	0	0	0	0	0	0	0	0	0
Missouri	[illegible]	[illegible]	14	0	0	0	0	0	0	0	0	0
North Dakota	3	[illegible]	17	0	0	0	0	0	0	0	0	0
South Dakota	4	0	2	0	0	0	0	0	0	0	0	0
Nebraska	0	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0
Kansas	18	37	3	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	11	0	0	0	0	0	0	0	0	0
Maryland [2]	[illegible]	37	[illegible]	0	1	0	0	0	0	0	2	0
District of Columbia	8	6	11	0	0	0	0	0	0	0	0	0
Virginia	27	104	75	0	0	0	110	0	0	0	[illegible]	2
West Virginia	20	[illegible]	33	0	0	0	0	0	0	0	0	0
North Carolina	8	208	[illegible]	0	0	0	0	0	0	0	0	12
South Carolina	10	45	32	0	1	2	0	0	0	0	0	4
Georgia	1	2	20	0	1	0	0	0	0	0	1	50
Florida	13	31	3	0	2	1	0	0	0	0	0	[illegible]
EAST SOUTH CENTRAL												
Kentucky	8	80	[illegible]	0	0	0	0	0	0	0	6	0
Tennessee	7	[illegible]	43	0	0	0	2	2	0	0	1	4
Alabama	39	[illegible]	13	0	0	0	0	1	0	0	0	20
Mississippi [2]				0	0	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	[illegible]	0	14	0	0	5	0	0	0	0	0	2
Louisiana	4	2	4	0	0	0	0	0	0	0	0	7
Oklahoma	13	4	4	0	0	8	0	0	0	0	0	0
Texas	[illegible]	138	120	0	15	405	33	0	0	0	0	27
MOUNTAIN												
Montana	24	6	6	0	1	0	0	0	0	0	0	0
Idaho	4	3	3	0	0	0	0	0	0	0	0	0
Wyoming	[illegible]	2	4	0	0	0	0	0	0	0	0	0
Colorado	[illegible]	31	31	0	0	0	0	0	0	0	0	0
New Mexico	0	0	[illegible]	0	0	10	1	0	0	0	0	0
Arizona	7	14	14	0	0	0	12	0	0	0	0	0
Utah [2]	[illegible]	26	[illegible]	0	0	0	0	0	0	0	1	0
Nevada	0	0	4	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	61	61	0	0	0	1	0	0	0	0	0
Oregon	12	[illegible]	26	0	0	0	0	1	0	0	0	0
California	[illegible]	101	192	0	6	5	0	2	0	0	0	2
Total	[illegible]	[illegible]	[illegible]	0	46	[illegible]	159	10	0	0	36	134
Same week, 1943	2 675			1	79	722	107	13	1	0	18	117
Same week, 1942	3 572			1	20	116	64	2	1	0	24	90
49 weeks, 1944	90 576			40	[illegible]	23 351	[illegible]	616	32	453	578	5 019
49 weeks, 1943	171 855			63	2 050	[illegible]	[illegible]	660	29	433	753	4 304
49 weeks, 1942	169 469		[4] 169 469	76	1 157	11 758	6 324	542	44	[4] 451	830	[4] 2 803

[2] Period ended earlier than Saturday.

[4] 5-year median, 1939-43.

WEEKLY REPORTS FROM CITIES

City reports for week ended December 2 1944

This table lists the reports from 89 cities of more than 10 000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table

	Diphtheria cases	Encephalitis infectious cases	Influenza		Measles cases	Meningitis meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine												
Portland	0	0	0	0	1	0	2	0	5	0	0	0
New Hampshire												
Concord	0	0	0	0	0	0	1	0	1	0	0	0
Vermont												
Barre	0	0	0	0	0	0	0	1	1	0	0	3
Massachusetts												
Boston	2	0	0	2	33	0	5	2	68	0	0	14
Fall River	0	0	0	0	0	0	1	0	2	0	0	7
Springfield	0	0	1	1	1	0	0	1	6	0	0	5
Worcester	0	0	0	0	0	0	4	0	1	0	0	6
Rhode Island												
Providence	0	0	0	0	0	1	2	0	6	0	0	7
Connecticut												
Bridgeport	0	0	1	0	0	0	0	0	1	0	0	0
Hartford	0	0	0	0	1	1	0	0	1	0	0	1
New Haven	0	0	[illegible]	0	0	0	4	0	5	0	0	8
MIDDLE ATLANTIC												
New York												
Buffalo	0	0	0	0	0	0	1	4	3	0	2	0
New York	11	0	1	1	13	13	56	23	142	0	2	113
Rochester	0	0	0	0	22	0	3	8	4	0	0	20
Syracuse	0	0	0	0	0		1	0	3	0	0	14
New Jersey												
Camden	0	0	0	0	0	0	0	0	0	0	0	0
Newark	0	0	0	0	4	1	2	1	2	0	0	6
Trenton	0	0	0	0	0	0	1	0	4	0	0	0
Pennsylvania												
Philadelphia	5	0	2	1	2	2	33	2	76	0	1	34
Pittsburgh	0	0	0	0	0	0	10	0	9	0	0	5
Reading	0	0	0	0	1	0	1	0	2	0	0	
EAST NORTH CENTRAL												
Ohio												
Cincinnati	2	0	0	1	1	1	6	0	21	0	0	1
Cleveland	4	0	5	0	2	3	0	2	35	0	2	17
Columbus	0	0	1	1	0	1	4	0	7	0	0	11
Indiana												
Fort Wayne	2	0	0	0	0	0	5	0	2	0	0	0
Indianapolis	7	0	0	2	2	1	10	0	3	0	0	7
South Bend	0	0	0	0	0	0	0	0	6	0	0	0
Terre Haute	0	0	0	0	0	0	4	0	1	0	0	0
Illinois												
Chicago	2	0	1	2	8	9	22	2	97	0	0	23
Springfield	0	0	0	0	3	2	2	0	3	0	0	0
Michigan												
Detroit	15	0	1	0	3	4	16	2	62	0	0	28
Flint	1	0	0	0	0	0	2	9	2	0	0	0
Grand Rapids	2	0	1	0	1	0	1	0	5	0	0	0
Wisconsin												
Kenosha	0	0	0	0	0	0	0	0	0	0	0	16
Milwaukee	0	0	2	2	3	1	2	0	23	0	0	7
Racine	0	0	0	0	1	0	0	0	2	0	0	0
Superior	0	0	0	0	1	1	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota												
Duluth	4	0	0	0	0	0	2	0	3	0	0	2
Minneapolis	4	0	0	0	0	0	0	0	17	0	0	3
St Paul	0	0	0	1	0	0	5	1	14	0	0	22

City reports for week ended December 2, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri												
Kansas City	0	0	0	2	0	1	7	0	17	0	1	1
St Joseph	0	0	0	0	0	0	0	0	2	0	0	0
St Louis	0	0	2	0	1	5	15	0	13	0	0	12
North Dakota												
Fargo	0	0	0	0	0	0	1	0	1	0	0	0
Nebraska												
Omaha	0	0	0	0	4	0	3	1	5	0	0	0
Kansas												
Topeka	0	0	0	0	0	1	0	0	7	0	0	3
Wichita	0	0	0	0	1	0	1	0	6	0	0	7
SOUTH ATLANTIC												
Delaware												
Wilmington	0	0	0	0	0	0	3	0	2	0	0	0
Maryland												
Baltimore	8	0	1	2	1	2	8	1	36	0	0	46
Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Frederick	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia												
Washington	0	0	0	0	1	2	7	2	18	0	0	4
Virginia												
Lynchburg	0	0	0	0	0	0	1	0	1	0	0	0
Richmond	0	0	0	0	0	0	1	0	13	0	0	0
Roanoke	1	0	0	0	0	0	0	0	0	0	0	1
West Virginia												
Charleston	0	0	0	0	0	0	0	0	5	0	0	0
Wheeling	0	0	0	0	1	0	1	0	0	0	0	0
North Carolina												
Raleigh	0	0	0	0	0	0	0	0	1	0	0	2
Wilmington	5	0	0	0	1	0	1	0	5	0	0	8
Winston Salem	0	0	2	0	0	0	0	0	5	0	0	2
South Carolina												
Charleston	0	0	14	0	1	1	1	0	1	0	1	0
Georgia												
Atlanta	0	0	9	1	0	0	3	0	4	0	0	0
Brunswick	0	0	0	0	0	0	1	0	1	0	0	0
Savannah	0	0	3	1	0	0	2	0	0	0	0	0
Florida												
Tampa	1	0	0	0	0	0	1	0	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee												
Memphis	1	0	5	2	19	5	[illegible]	0	10	0	0	6
Nashville	0	0	0	0	2	0	2	0	1	0	0	0
Alabama												
Birmingham	1	0	5	0	1	2	5	0	4	0	0	0
Mobile	1	0	0	0	0	0	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas												
Little Rock	0	0	0	0	0	0	0	0	4	0	0	0
Louisiana												
New Orleans	2	0	6	2	2	2	11	0	3	0	1	0
Shreveport	1	0	0	0	0	0	4	0	0	0	1	0
Texas												
Dallas	3	0	0	0	0	0	1	0	5	0	0	3
Galveston	0	0	0	0	0	0	2	0	5	0	1	0
Houston	2	0	0	0	0	2	7	0	4	0	0	0
San Antonio	1	0	2	1	1	0	2	1	4	0	0	2
MOUNTAIN												
Montana												
Billings	0	0	0	0	0	0	4	0	2	0	0	0
Helena	0	0	0	0	0	0	0	0	0	0	0	0
Missoula	0	0	0	0	0	0	5	0	0	0	0	0

City reports for week ended December 2, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
MOUNTAIN—continued												
Idaho												
Boise	0	0	0	0	1	0	0	0	3	0	0	0
Colorado												
Denver	1	0	6	1	6	1	8	0	14	0	3	6
Pueblo	0	0	0	0	0	0	0	0	4	0	0	0
Utah												
Salt Lake City	0	0	0	0	0	1	0	1	4	0	0	5
PACIFIC												
Washington												
Seattle	2	0	0	0	4	4	3	0	9	0	0	3
Spokane	1	0	0	0	2	1	1	0	2	0	0	0
Tacoma	0	0	0	0	0	0	0	0	0	0	0	0
California												
Los Angeles	8	0	6	2	14	0	7	0	46	0	0	8
Sacramento	0	0	0	0	1	0	2	0	7	0	0	4
San Francisco	1	0	2	0	15	1	10	0	15	0	0	9
Total	101	0	82	28	185	81	349	55	939	0	15	513
Corresponding week, 1943	84		367	42	1,569		483		917	1	17	609
Average, 1939–43	96		712	[1] 48	[2] 964		[1] 448		838	2	20	1,000

[1] 3-year average, 1941–43.
[2] 5-year median, 1939–43.

Dysentery, amebic.—Cases: Boston, 4; Chicago, 1.

Dysentery, bacillary.—Cases: Buffalo, 2; New York, 12; Syracuse, 1; Chicago, 1; Detroit, 1; St. Louis, 1; Charleston, S. C., 2; Los Angeles, [illegible].

Dysentery, unspecified.—Cases: Baltimore, 1; Richmond, 1; Mobile, 1; Dallas, 1.

Typhus fever, endemic.—Cases: Atlanta, 3; Savannah, 4; Tampa, 3; Nashville, 1; Birmingham, 3; Mobile, 1; New Orleans, 3; Houston, 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,365,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	13.1	7.8	102	28.8	49.7	10.5	254	0.0	0.0	133
Middle Atlantic	7.4	0.0	1.4	0.9	19	7.4	51.4	17.6	113	0.0	2.3	89
East North Central	21.3	0.0	6.7	4.9	15	14.0	45.0	3.6	166	0.0	1.2	67
West North Central	15.9	0.0	4.0	6.0	12	13.9	67.6	4.0	109	0.0	2.0	99
South Atlantic	24.5	0.0	47.4	6.5	8	8.2	49.0	4.9	152	0.0	1.6	103
East South Central	17.7	0.0	50.0	11.8	130	41.3	82.6	0.0	89	0.0	0.0	35
West South Central	25.8	0.0	23.0	8.6	9	11.5	77.5	2.9	72	0.0	8.6	14
Mountain	8.3	0.0	40.9	8.8	58	16.6	141.4	8.3	225	0.0	25.0	92
Pacific	19.0	0.0	12.7	3.2	57	9.5	36.4	0.0	125	0.0	0.0	38
Total	16.4	0.0	12.5	4.3	28	12.3	53.1	8.4	143	0.0	2.3	78

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended December 2, 1944.—During the 4 weeks ended December 2, 1944, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	4	Measles	209
Cerebrospinal meningitis	1	Opthalmia neonatorum	1
Chickenpox	2	Poliomyelitis	1
Diphtheria	36	Syphilis	573
Dysentery (unspecified)	3	Tetanus	14
Erysipelas	1	Trachoma	1
Filariasis	1	Tuberculosis (all forms)	590
Gonorrhea	403	Typhoid fever	21
Influenza	80	Typhus fever (murine)	5
Malaria	1,026	Whooping cough	46

DEATHS DURING WEEK ENDED DECEMBER 2, 1944

[From the Weekly Mortality Index issued by the Bureau of the Census Department of Commerce]

	Week ended Dec 2, 1944	Corresponding week, 1943
Data for 93 large cities of the United States		
Total deaths	9 406	9,948
Average for 3 prior years	9 462	
Total deaths, first 48 weeks of year	430 826	438 776
Deaths under 1 year of age	604	706
Average for 3 prior years	650	
Deaths under 1 year of age first 48 weeks of year	29,708	31,669
Data from industrial insurance companies		
Policies in force	66 918 568	66 088,599
Number of death claims	14 314	12,132
Death claims per 1,000 policies in force, annual rate	11 2	9 6
Death claims per 1,000 policies, first 48 weeks of year annual rate	10 0	9 6

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 18, 1944.—During the week ended November 18, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		38		403	319	46	34	65	96	1,001
Diphtheria	3	10	2	76	8	8	6	1		114
Dysentery (bacillary)				20						20
German measles		2			5			4	11	22
Influenza		6			13	1			11	31
Measles		3	1	321	165	15	25	5	81	616
Meningitis, meningococcus				2	1				1	4
Mumps				473	31	4	70	18	39	635
Poliomyelitis					[1] 5	1		1		[1] 7
Scarlet fever		19	8	215	174	17	18	30	46	527
Tuberculosis (all forms)		12	1	135	54	4	2	27	57	292
Typhoid and paratyphoid fever			1	8	1		1			11
Undulant fever				1						5
Venereal diseases.										
Gonorrhea	1	34	17	97	201	47	25	34	51	507
Syphilis	2	17	14	115	112	13	7	14	21	315
Whooping cough		22		259	52	7	6	25	40	411

[1] Includes 1 case, delayed reports.

JAMAICA

Notifiable diseases—4 weeks ended November 18, 1944.—During the 4 weeks ended November 18, 1944, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Leprosy		4
Chickenpox	1	2	Tuberculosis (pulmonary)	21	60
Diphtheria	6	2	Typhoid fever	8	98
Dysentery (unspecified)	45	113	Typhus fever		1
Erysipelas	1				

NEW ZEALAND

Notifiable diseases—4 weeks ended November 4, 1944—During the 4 weeks ended November 4, 1944, certain notifiable diseases were reported in New Zealand as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	13	2	Puerperal fever	3	
Diphtheria	55	5	Scarlet fever	745	2
Dysentery (bacillary)	11		Tetanus	3	
Erysipelas	21		Trachoma	5	
Hookworm disease	3		Tuberculosis (all forms)	182	54
Malaria	46		Typhoid fever	2	1
Ophthalmia neonatorum	2		Undulant fever	1	

SWEDEN

Notifiable diseases—September 1944—During the month of September 1944, cases of certain notifiable diseases were reported in Sweden as follows

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	7	Poliomyelitis	438
Diphtheria	185	Scarlet fever	2 255
Dysentery	488	Syphilis	133
Encephalitis epidemic	1	Typhoid fever	8
Gonorrhea	1 784	Undulant fever	2
Hepatitis epidemic	632	Weil's disease	4
Paratyphoid fever	11		

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER

From medical officers of the Public Health Service American consuls International Office of Public Health Pan American Sanitary Bureau health section of the League of Nations and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases]

NOTE —Since many of the figures in the following tables are from weekly reports the accumulated totals are for approximate dates

Place		January-September 1944	October 1944	November 1944—week ended— 4	11	18	25
ASIA							
Ceylon	C	2					
India	C	223 378	14 374				
Calcutta	C	3 253	117	27	33		
Chittagong	C	63					
Madras	C	37					
Negapatam	C	17					
Vizagapatam	C	269					

PLAGUE

[C indicates cases D deaths P, present]

Place		January-September 1944	October 1944	November 1944—week ended— 4	11	18	25
AFRICA							
Algeria	C	22	23				
Bechuanaland	C					[1] 171	
Belgian Congo	C	12	7	2			
Plague infected rats		P					
British East Africa							
Kenya	C	11	1				
Uganda	C	5	1			1	
Egypt	C	645	4	2	1		
Port Said	C	73	1	2			
Suez	C	157	2		1		
French West Africa Dakar	C	460	54	10	17	5	
Madagascar	C	85	14				
Morocco (French)	C	144	27				
Rhodesia northern	C	1					
Senegal	C	42	1	6	7		
Sudan (French)	D		1				
Tunisia	C	26	12				[2] 8
Union of South Africa	C	39	4		2		
ASIA							
China							
Chekiang Province	C	P	P				
Foochow	C	P					
Kiangsi Province	C	104					
India	C	8 138	938				
Indochina	C	57					
Palestine	C	44	25		8	2	
Plague infected rats		84	48				
EUROPE							
Portugal Azores	C	20	8	1			
SOUTH AMERICA							
Bolivia							
Chuquisaca Department	C	5					
Santa Cruz Department	C	5					
Tarija Department	C	12					
Brazil	C	94					
Ecuador							
Chimborazo Province	C	4					
Loja Province	C	6	4				
Peru							
Ancash Department	C	57	3				
Lambayeque Department	C	1					
Libertad Department	C	6					
Lima Department	C	20	2				
Piura Department	C	2					
OCEANIA							
Hawaii Territory							
Hamakua District	D	[3] 5					
Plague infected rats [4]		[5] 50	3	2			

[1] From the beginning of the outbreak in October 1944
[2] For the period Nov 1-20 1944
[3] Includes 1 death from pneumonic plague
[4] Plague infection was also proved in a pool of 53 fleas on Mar 7, 1944
[5] Includes 12 plague infected mice Plague infected tissue in a pool of 8 mice was also reported during August 1944

SMALLPOX

[C indicates cases; P, present]

Place		January-September 1944	October 1944	November 1944—week ended— 4	11	18	25
AFRICA							
Algeria	C	808	61				
Angola	C	35					
Basutoland	C	201					
Belgian Congo	C	1,826	894				
British East Africa:							
Kenya	C	3,052	51	43			
Mombasa	C	143	1				
Tanganyika	C	2,636	1				
Uganda	C	3,750	299	69			
Cameroon (French)	C	370	17		23		
Dahomey	C	88					
Egypt	C	10,831	9				
French Equatorial Africa	C	1,306					
French Guinea	C	1,002	20				[1] 55
French West Africa	C	129	36		56		
Gambia	C	13					
Gold Coast	C	7			6		
Ivory Coast	C	446	9		22		
Mauritania	C	2					
Morocco (French)	C	680					[1] 59
Mozambique	C	3					
Nigeria	C	3,753	199	38			
Niger Territory	C	582	1				[1] 4
Senegal	C	190	1				
Sierra Leone	C	393					
Sudan (Anglo-Egyptian)	C	1					
Sudan (French)	C	1,926	90				[1] 18
Togo	C				78		
Tunisia	C	8					
Union of South Africa: Natal	C		[2] 1,800	21	11		
ASIA							
Arabia	C	[3] 26					
Ceylon	C	8	11	9			
China: Kunming (Yunnan Fu)	C	53			1		
India	C	231,681	6,048				
Indochina	C	1,557					
Iran	C	790					
Iraq	C	43	11				
Palestine	C	165					
Syria and Lebanon	C	179			2		
EUROPE							
France	C	1					
Gibraltar	C	P					
Great Britain	C	[4] 18					
Greece	C	321					
Italy	C	761	117	28	37		
Portugal	C	32					
Spain	C	167	2				
Turkey	C	5,620		32	2	10	4
NORTH AMERICA							
Dominican Republic	C	1					
Guatemala	C	9					
Honduras	C	9					
Mexico	C	2,347	136				
Panama (Republic)	C	1					
SOUTH AMERICA							
Bolivia	C	908	78				
Brazil	C	7,812	150				
Chile	C		15	15			
Colombia	C	1,495					
Ecuador	C	19	3				
Peru	C	253					
Lima	C	19					
Venezuela	C	368	49				

[1] For the period Nov. 1-20, 1944.
[2] Approximate number of cases reported from Jan. 1944 to Nov. 9, 1944.
[3] Includes imported cases.
[4] Includes 1 case imported from the Middle East.

TYPHUS FEVER*

[C indicates cases]

Place		January-September 1944	October 1944	November 1944 week ended— 4	11	18	25
AFRICA							
Algeria	C	1 222	116				
Basutoland	C	95					
Belgian Congo	C	32	24				
British East Africa Kenya	C	12	1	1			
Egypt	C	10 562	[illegible]				
French Guinea	C	2					
French West Africa Dakar	C	48	4				
Gold Coast	C	6					
Morocco (French)	C	[illegible] 382	28				[1] 116
Morocco (Spanish)	C	8	1				
Mozambique	C	2	1				
Nigeria	C	[illegible]					
Rhodesia northern	C	8	11				
Sierra Leone	C	30					
Sudan (Anglo Egyptian)	C	3					
Tunisia	C	708	70				[1] 170
Union of South Africa	C	[illegible]					
ASIA							
Arabia Western Aden Protectorate	C	1	1				
Ceylon	C	1					
China Kunming (Yunnan Fu)	C	102	7	4	5	3	
India	C	10					
Indochina	C	1 004					
Iran	C	[illegible]					
Iraq	C	5[illegible]	10				
Palestine	C	4[illegible]	1[illegible]	3		3	
Syria and Lebanon	C	4[illegible]8					
Trans Jordan	C	45					
EUROPE							
Belgium	C	10					
Bulgaria	C	68[illegible]					
France	C	11					
Germany	C	[illegible]					
Gibraltar	C		1				
Greece	C	2[illegible]					
Hungary	C	3 [illegible]	1				
Irish Free State	C			1			
Italy	C		1				
Netherlands	C	8					
Norway	C	1					
Portugal	C	8	10	2	1	2	
Rumania	C	[illegible] 0					
Slovakia	C	33[illegible]	1				
Spain	C	4[illegible]3	4				
Turkey	C	2 334		15	35	37	66
Yugoslavia	C	[illegible]2	116				
NORTH AMERICA							
Costa Rica [3]	C	2					
Dominican Republic	C	10					
Guatemala	C	1 8[illegible]0	109				
Jamaica	C	[illegible]			1		
Mexico	C	1 433	124				
Panama Canal Zone	C	1					
Puerto Rico [3]	C	1[illegible]1					
Salvador	C	[illegible]					
Virgin Islands [3]	C	1[illegible]					
SOUTH AMERICA							
Bolivia	C	253	32				
Brazil	C	4					
Chile	C	392	9	2	4	3	3
Colombia	C	303					
Curacao	C	5	1				
Ecuador	C	336	108				
Peru	C	[illegible]40					
Venezuela	C	8[illegible]	[2] [illegible]				
OCEANIA							
Australia	C	157	8				
Hawaii Territory	C	117	[illegible]3	[illegible]	2		

* Reports from some areas are probably murine type, while others probably include both murine and louse borne types

[1] For the period Nov 1–20, 1944

[2] A report dated Mar 30 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia

[3] Reported as murine

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-September 1944	October 1944	November 1944—week ended— 4	11	18	25
AFRICA							
Belgian Congo:							
Babeyru	D	2					
Banzyville	C	[1] 13					
Bondo	D	1					
Leopoldville	C	1					
Gold Coast:							
Cape Coast	C	[2] 1					
Ho	C	[2] 1					
Kintampo	C	1					
Northern Territories	C	1					
Sekondi	C	[2] 1					
Tamale	C	[2] 1					
Yendi	C	[2] 1					
Ivory Coast:							
Abidjan	C	1					
Divo	C						[2] 1
Nigeria: Bukuru	C	1					
Portuguese Guinea: Port Bintam	C	1					
EUROPE							
Portugal: Lisbon.[3]							
SOUTH AMERICA							
Bolivia:							
La Paz Department	C	1					
Santa Cruz Department	C	3					
Brazil:							
Acre Territory	D	1					
Matto Grosso State	D	3					
Para State	D	2					
Colombia:							
Amazonas Department	D	1					
Boyaca Department	D	4					
Caldas Department	D	1					
Cundinamarca Department	D	1					
Intendencia of Meta	C	1					
Santander Department	D	4					
Venezuela: Tachira State	C	[4] 29	1				

[1] Includes 11 suspected cases of yellow fever.
[2] Suspected.
[3] According to information dated Jan 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board.
[4] Includes 21 cases of suspected yellow fever.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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